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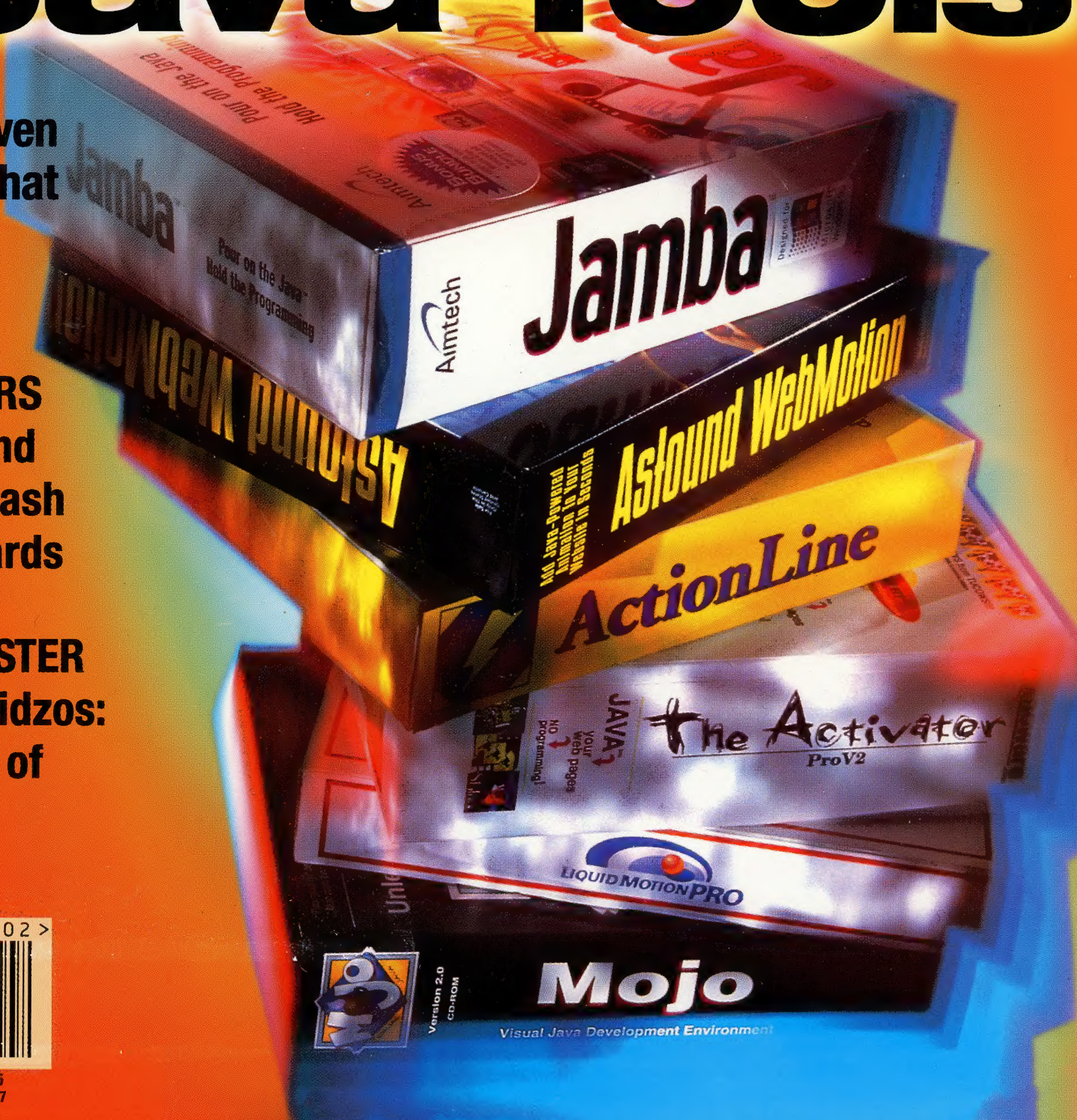
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Contents

volume 8 // number 2

Page 50

DEPARTMENTS

FROM THE EDITOR 8

LETTERS TO THE EDITOR 10

INTERNET NEWS 15

THE SURFBOARD 26

INTERNET FORUM 114

INDEX TO ADVERTISERS 126

EDITORIAL PRODUCT INDEX ...127

LOGOUT 128

Cover: *Photograph by John Wilkes*

FEATURES

Multimedia Comes of Age
Streaming audio and video, Java, ActiveX, and VRML are maturing and changing the Net. Find out what the future is bringing.
By Gary Welz 44

The Origin of PCs
From Babbage's Difference Engine to the Macintosh and Windows 95, you can plumb the rich history of the personal computer on the Net.
By David Noack 50

Cryptic Minister
RSA Data Security makes technology the U.S. government doesn't like. CEO Jim Bidzos talks about the light and dark sides of encryption.
By Jeff Ubois 58

Object Wars
Vendor politics undermine the vision of a universal object standard that would allow every computer on the Net to share all information online.
By David F. Carr 66

IW Labs
Live Pages
Java makes the Net dance and sing. But the Java programming language is formidable. IW Labs looks at seven new tools that enable you to create Java applets without a Ph.D.
By Gus Venditto 72

Page 40

Astound WebMotion
Four on the Java Hold the Programming
Jamba
Mojo
ActionLine

Page 72

FEBRUARY 1997

COLUMNS

CYBERLIBRARIAN // **Doctor's Advice**
You can tap into a growing cadre of medical experts who are dispensing advice online for free—with no appointments and no waiting rooms.
By Cynthia N. James-Catalano 30

MONEY TRAIL // **Marketing Riddle**
How do you increase your online reach? The Riddler, Link Exchange, and TipWorld use models that play to the Internet's cooperative culture.
By Rosalind Resnick 36

WEB WATCH // **Directing Traffic**
Does your site handle traffic effectively? Will it scale up? Site-analysis and load-balancing tools can help you anticipate and fix problems.
By Niel Robertson 40

LAW OF THE NET // **Foul Play**
The Software Publishers Association appears to be using strong-arm tactics to force small ISPs to settle meritless lawsuits.
By Mike Godwin 90

BOTTOM LINE // **Snubbing Standards**
Companies make life on the Net unnecessarily difficult by failing to support established standards and attempting to set their own.
By Joel Snyder 96

LEADING EDGE // **Unwired**
A new wave of wireless telephones—including a wristwatch model—will let you receive e-mail on the go. Here's the scoop.
By Jeff Pulver 100

WEB PAGE WORKSHOP // **Brewing JavaScript**
Get the full kick of interactive HTML without the overhead. Bottle your own at home, using free materials. Here's how to get started.
By Reaz Hoque 104

THE KANTOR GROUP // **Privacy in the Internet Age**
Does having the Internet mean losing our privacy? The Group discusses the pros and cons of easy information access. 108

IW ONLINE

www.iw.com

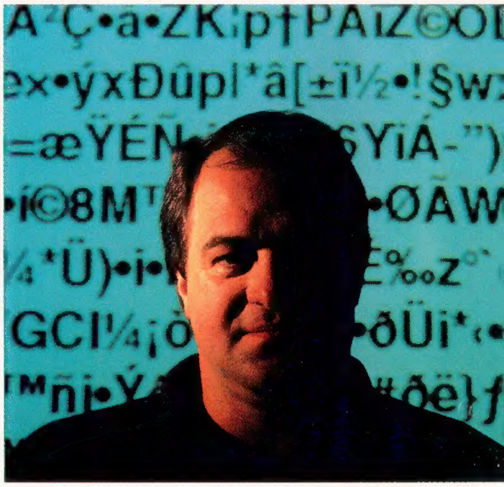
THE NET.ANSWER MAN
By Kevin M. Savetz

FOUND IT ON THE NET
By Linda J. Engelman

REC ROOM
Return of the Classics
By Eric Berlin

POINTERS
Gardening
By Susie Davis

BACKROOM POLITICS
Standard Setting
and the W3C
by Kris Herbst



Page 58

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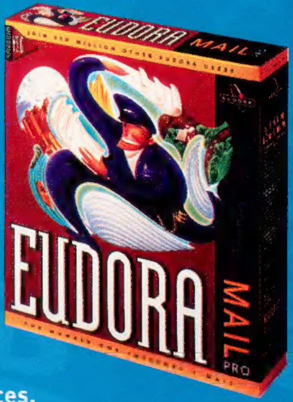

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CIRCLE NUMBER 92

From the Editor

A Blessing and a Curse

Our cover story this month focuses on a new crop of authoring tools that enable nonprogrammers to add Java applets to Web sites ("Live Pages," p. 72). These tools raise the bar in personal publishing, just as HTML authoring tools and word processing programs did before them.

One of the most significant developments on the Internet has been the introduction of Sun's Java programming language—a technology that brings cross-platform information sharing and new forms of motion and interactivity to the Net. Fanned by tremendous media hype, the Java movement spread like wildfire and set in motion a furious wave of development. Java caused Microsoft to field a competitive technology called ActiveX. It also sparked the idea of the network computer, a "thin client" that would enable users to pull applications off the Internet.

Java has been slow to fulfill its promise because of the immaturity of the original releases. As Bill Blundon reported in Dec. *IW* ("The Truth About Java"), Java has required a good deal of tweaking to speed up its performance and enable it to live up to its much-touted cross-platform capabilities. Although Blundon concedes that "Java is part religion, part marketing hype, and part reality," he concludes that "barring some unanticipated development, Java looks unstoppable."

Java's unstoppability has been a problem for Microsoft, which fears losing control of a critical standard in its bid to maintain its dominance of a desktop market that is rapidly becoming Internet connected. If network computers running non-Microsoft operating systems can pull Java applications off the Net, Microsoft becomes expendable.

Unsurprisingly, Java has received heavy support by Microsoft's enemies, including IBM, Netscape, and Oracle, which, along with Sun, also are fervent proponents of network computers.

Although Microsoft cannot own the Internet, its strategy is to channel all of users' Internet activities through Microsoft products while convincing software developers to base their Internet products on proprietary Microsoft technology.

Microsoft's chief rival is Netscape, and the two companies are fighting a battle for ownership of the Internet's browser and server market, including development platforms and network multimedia technologies. The battle also has moved to the network computer arena.

Java has become a pawn in this game. Microsoft has licensed Java and is supporting it in its products, but is seeking to minimize its impact by propagating ActiveX. The Java vs. ActiveX battle has spawned a welter of rumors, including a report that Microsoft is attempting to co-opt Java by establishing its Windows virtual machine as a standard and coercing Java developers to incorporate ActiveX controls into their applications. This would pull Java into the confines of the Windows sphere.

Vendors can win big by controlling standards, which is why every major new Internet technology has become a hotly contested standards battle between Microsoft and Netscape. You will find that standards is a theme running throughout this issue. Gary Welz describes the two streaming media standards backed by Netscape and Microsoft, respectively ("Multimedia Comes of Age," p. 44), while David Carr relates the Microsoft vs. Netscape clash over distributed object standards ("Object Wars," p. 66). Joel Snyder vents his frustration over Netscape and Microsoft's disregard of standards ("Snubbing Standards," p. 96). Meanwhile, Kris Herbst reports on the behind-the-scenes standards dealings in the W3C (on IW Online, **http://www.iw.com**).

Multimedia, and computing in general, has been cursed by a profusion of incompatible formats. The history of computing also is littered with well-intentioned standards efforts that have failed. While ownership of a standard can create a dynasty, proprietary technology also is a two-edged sword that can topple an empire when the currents shift (as Wang and many others can attest). What will happen on the Net? We live in interesting times.

Michael Neubarth

MICHAEL NEUBARTH

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Letters to the Editor

GRAMMAR COUNTS

Thank you very much for the "E-Mail Face Off" (Dec. '96 *IW*). I used to use Eudora Pro and liked it very much. However, one thing, and one thing only, caused me to switch to Netscape's built-in e-mail: CyberSpell, a spelling and grammar checker. I have told the good folks at Qualcomm that I will come back to Eudora Pro if they include CyberSpell or an equivalent, but they still only have a spell-checker.

LEE ELLIS
indiolee@cyberg8t.com

BID FOR BECKY

In your "E-Mail Face Off" (Dec. '96 *IW*), Becky from RIM-Arts Software (**http://www.bekkoame.or.jp/~carty**) should have been included in the comparison. I find Becky just as capable as Eudora Pro 3.0 (which *Internet World* picked as one of the two top mail programs), and I like Becky's design much better.

RIM-Arts has designed a truly superior e-mail program and deserves some recognition.

MONTY SCROGGINS
monty@dhc.net

PITCH FOR PINE

In your IW Lab test of e-mail software (Dec. '96 *IW*), I was a bit surprised to see that you did not test or even mention Pine. Although Pine may not have all the bells and whistles of the other software, it still serves its purpose. Pine supports MIME and is relatively easy for users with its menu-based system. Pine is available as an e-mail program on most servers that have Unix/Linux on them and is derived from elm and pico.

It looks like you have forgotten the original Net. Maybe Pine is too outdated for some young Netizens that want to surf the Web and never see the actual workings of a server. People like me who don't have a dialup connection are limited in what we can do. For more info on Pine, FTP, oh, I mean point your Web browser, to **http://www.washington.edu:1180/pine**.

TODD WARFIELD
hafnium@dilbert.shawnee.edu

WHY NCS MAKE SENSE

I must take issue with "The NC Follies" (Dec. '96 *IW*). Author Steven J. Vaughan-Nichols seems to misunderstand the market for network computer devices entirely. It's not surprising that he could not find an NC when looking at his local computer superstore. Why would a consumer want one? Until the communications infrastructure improves to the point where it approaches LAN speeds to the home, the notion of an NC for consumer use is ridiculous.

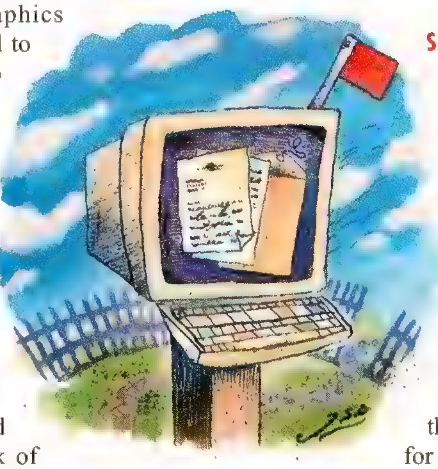

Illustration by John S. Dykes

As far as applications go, it is possible to run today's current Windows applications on an NC by running Citrix's WinFrame on an NT server. The NC client has the graphics primitives delivered to it for presentation to the user. The program is executed on the NT server, not on the NC.

The whole idea of the NC is to reduce the cost of ownership. PCs cost too much, primarily due to custom configurations and the end-user's lack of PC knowledge. With centralized apps, be they HTML-, Java-, or Windows-based, the IS folks are now back in the driver's seat. Support costs for NCs will be very close to those of dumb terminals. Speaking of dumb terminals, IBM estimates that there are 10 to 12 million of them in use (I'm not sure if this number just reflects their terminals or the total amount). The NC, as Vaughan-Nichols points out, is a dumb terminal. But it is an excellent low-cost replacement for the aging population of dumb terminals.

For large campus environments, or state-of-the-art ATM- or Frame Relay-based WANs, the NC is a good idea. For home use, with today's network connections, forget it!

ERIC DREW
anecomp@interlog.com

NCS WILL RULE

I was disappointed in "The NC Follies" (Dec. '96 *IW*). Like it or not, network computers will spread through corporations like wildfire because NCs will always be cheaper than comparable PCs.

A corporation buying an NC with 8MB of RAM is as unrealistic as buying an 8MB PC. It just doesn't happen anymore. As the author pointed out, the applications we've become accustomed to require far more than 8MB. But RAM is cheap, and no matter how much you stuff in, an NC will always be cheaper than a PC with the same amount of RAM—far cheaper if you consider long-term ownership costs.

NCs are the future of all computing. Hard disks belong on servers.

CHRIS MCKINSTRY
chris@clickable.com

SOLD ON NCS

Having just purchased a $210 WebTV unit from Philips Magnavox, I found Steven J. Vaughan-Nichols' "The NC Follies," (Dec. '96 *IW*) interesting. I'm one of the 65 percent of people who don't want to own a PC but are interested in surfing the Net, so this is the unit for me. You may be correct in that it might be a passing fad, but then again, so was rock 'n' roll!

ROY A. FLOOD
lakota@webtv.net

SPAM LIKE FAX

I am tired of hearing junk e-mail compared endlessly to junk postal mail. I'd rather see it compared to junk faxes. There are laws against junk faxes (check out **http://www.law.cornell.edu/uscode/47/227.html**).

I have to be fair and say that there has been some bulk e-mail that I have welcomed and responded to. This is because somebody actually took the time to find out if I would be interested in such a prospect.

The root of the problem is that bulk e-mail is too cheap. For $20 per month, you can spam as many people as you want. With junk paper mail, you need to pay for printing and postage. With telemarketing, you need to pay for somebody to make the calls. Therefore, you are going to have some encouragement to only mail likely customers.

KEN WRONKIEWICZ
wh3947a@tso.cin.ix.net

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CIRCLE NUMBER 82

Letters to the Editor

SAD COMMENTARY

I am writing in response to Paul J. Rosen's letter "The Wages of Spam" (Nov. '96 *IW*). I was dismayed at his opinion that the only way the Internet will survive is by people using it as a medium for advertising. It reminds me of the adage, "If the only tool you have is a hammer, then everything starts looking like a nail."

Although it may be true that the business of America is business, much of the world sees commerce as a means to an end, not an end in itself. I have also learned that your lot in this world is what you make it, so those who think the Web is merely a place to exchange money deserve the Web they get. If, on the other hand, this vast network can be woven into a treasure trove of art, science, communication, recreation, and trade, then our world will be the richer for it.

HARRIS ROEN
70531.2743@compuserve.com

IW MAN

As a fellow editor and cyberliterate reader, my compliments go out to you and your staff for an excellent December issue. I will be forever remembered by my friends and associates as "An *Internet World* Man."

SHANNON ROXBOROUGH
globaltips@aol.com

STICKING WITH AOL

I read your magazine religiously and especially enjoy The Kantor Group. In response to "Davids vs. Goliath" (Dec. '96 *IW*), AOL is now providing its service at a flat rate ($19.95 per month). I might buy the argument that ISPs would eventually drive AOL out of business, given AOL's previous pricing scheme. But Steve Case has apparently seen the light and has responded with a price that will keep me logging on to AOL.

I have tried to get information ranging from home repairs, automobiles, back trauma, and grief counseling. When I searched the Web, I found thousands of sites on these topics. But I don't have the time nor the money to sift through them. When I search on AOL, I typically find a single forum chock full of useful information. These folks have done their homework.

I certainly respect and enjoy the participants in The Kantor Group, but maybe they should talk to the users of AOL.

S. KEVIN PINEGAR
kpinegar@juno.com

UPDATES AND CORRECTIONS

In the Dec. '96 *IW* pull-out map titled "Internet Snapshot," three of UUnet's DS-3 lines were inadvertently left out. These lines connect from Seattle to Vancouver, Buffalo to Toronto, and Montreal to New York.

Also in Dec. '96 *IW*, the story "VRML Evolution" mentioned the Liquid Reality API (p. 65) but neglected to say that Liquid Reality is a VRML 2.0 environment from Dimension X. Microsoft has licensed Liquid Reality technology to add VRML 3-D viewing and creation capability to its platforms. Liquid Reality, which is written in Java, also runs on Macintosh and Unix platforms.

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BACKWEB CHANNELS

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CIRCLE NUMBER 52

News

Edited by Amy Dunlop

ON AND ABOUT THE NET

E-MARKETING

The Right to Spam

Dubbed the "king of spam" and the "most hated man on the Internet," Sanford Wallace is doing his best to live up to his reputation as companies try to stop him. Wallace is the president of Cyber Promotions (**http://www.cyberpromo.com**), a company based in Dresher, Pa., that specializes in filling two million e-mail inboxes a day with largely unsolicited commercial advertisements. Nearly all the addresses on Cyber Promotions' mailing list are America Online customers, which is why Wallace sued the online service when it took steps to stem the flood of incoming messages. However, a federal court disagreed with the mass e-mailer, ruling in November that the firm has no First Amendment-protected right to spam.

Cyber Promotions plans to appeal. "We believe the lower court didn't have access to all the facts that make up this issue. . . . We'll be bringing this to an appeals court," Wallace says. This lawsuit may help define the legal status of Internet service providers and the extent to which the government may interfere with them. More ominously, it comes at a time when some consumer advocates are starting to call for a ban on spam.

Wallace's legal argument centers around the concept that AOL is a "public forum," or a place like a public park where censorship is not allowed. "We believe that e-mail is a public forum and should be treated like a public forum," Wallace says.

He also argues that e-mail is similar to telephone or postal service, pointing out that AT&T is barred from "deciding they're not going to allow telephone solicitations to go to Pennsylvania."

Solveig Bernstein, a lawyer at the Cato Institute in Washington, D.C., says that, unlike telephone companies, Internet providers are not common carriers. "The concept of common carrier was intended to control monopoly power," she says. AOL is not a monopoly because customers are free to switch to another ISP.

The AOL lawsuit isn't Cyber Promotions' only legal skirmish. In October, CompuServe won a temporary restraining order blocking Cyber Promotions from using a compuserve.com return address in its e-mail. Prodigy has also sued. Sprint tried to pull the plug on Wallace's network connection. And Concentric Network has received a permanent injunction from a federal court barring Cyber Promotions from e-mailing any unsolicited advertisements to its subscribers. Concentric also will receive $5,000 and a written apology.

But to Wallace, the most tempting target is AOL and its seven million members. "The keyword is stranglehold. [AOL has] a stranglehold on the e-mail addresses and advertising," he says of his nemesis. "We're arguing that e-mail is a public function and a public company can't block it selectively."

When speaking with reporters, Wallace likes to say that technology provides a way to block spam. New technologies may indeed let his spam recipients fight back. Cypherpunks (**http://infinity.nus.sg/cypherpunks/current**) and online-commerce advocates have been discussing a scheme using electronic cash that would create an "e-guard-dog" to protect users' inboxes. As part of your mail reader, the guard dog would recognize mail from known senders and allow the messages to pass. When you receive mail from a stranger, the guardian would levy a charge of a few cents, payable in DigiCash's e-cash. The plan would shift the cost back to the sender—where it belongs—and could put megaspammers like Cyber Promotions out of business overnight.

—Declan McCullagh

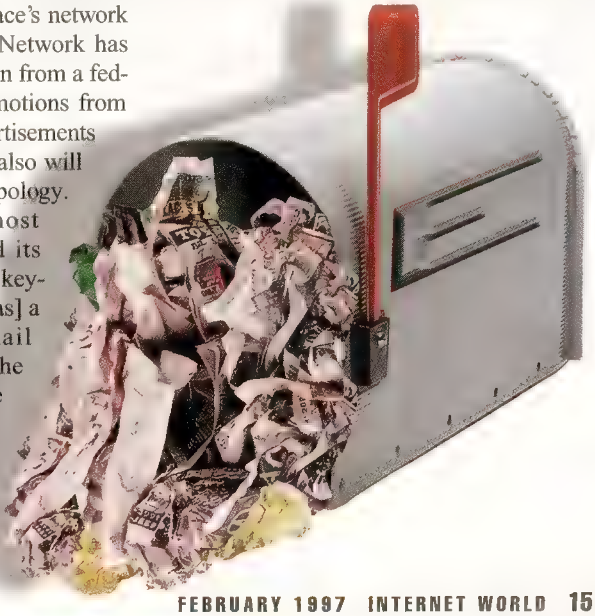

Photo Illustration by Lou Beach

ONLINE GAMING

Place Your Bets, Break the Law

Gambling is big business, with Americans wagering $550 billion last year and gambling companies racking in $44.4 billion in revenues. Can it be any surprise that Internet-gambling ventures want in on the action? While only a handful of companies currently offer live online betting, you can expect to see the number grow steadily as technology improvements satisfy public concerns over the security of Internet transactions and minimize the lag time in live play. That is, this *could* happen, unless the National Association of Attorneys General (NAAG) has its way.

Led by Hubert H. Humphrey III, attorney general of Minnesota, the NAAG is urging the federal government to stop Internet gambling. A June 1996 report by the group, "Gambling on the Internet; Report to the Internet Working Group of the NAAG," calls for the Wire Communications Act to directly address Internet gambling, even adding a penalty for the casual bettor (thereby making it illegal for you to place an occasional $5 bet from your computer) and making it clear that ISPs will be held liable by the law.

VIRTUAL VEGAS
Net Pirates
WORLDWIDE PROGRESSIVE SLOTS
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There are no national laws covering gambling, except for the Wire Act and the Indian Gaming Regulatory Act. Sen. John Kyl (R-Ariz.) did introduce a bill last year to make gambling illegal on the Internet, but it was killed in committee. The appointment of a National Gaming Commission, expected at press time, will most likely lead to federal laws concerning Internet gambling. Generally, however, gambling legalities have been left up to each state.

California, for instance, plans to threaten prosecution of telephone companies that provide connectivity to the ISPs that host casino-gaming pages. Minnesota, meanwhile, filed a suit against Granite Gate Resorts (which isn't yet live on the Internet) in July 1995 claiming consumer fraud because the company advertised that gambling online is legal when it isn't (according to the state). In its complaint, the state claims: "Federal law prohibits the foreign or interstate transmission of bets or wagers or information on bets or wagers by use of wire communication. Defendants have engaged in false advertising, deceptive trade practices and consumer fraud by representing that their sports handicapping service and proposed sports bookmaking service are lawful."

Granite Gate has a casino registered in Belize, but its offices are in Las Vegas. Gambling companies have found it easier to set up base in gambling-tolerant foreign countries, often choosing the Caribbean or Central America. Carolyn Ham, assistant attorney general for Minnesota, doesn't expect an offshore base to shield companies from prosecution. "It may be legal to offer gambling services to someone in that country, but it's not legal in the United States. It's clear that state and federal law prohibits gambling over the Internet," she states. (At press time, a judge in Minnesota ruled that the state did have jurisdiction to pursue its case against Granite Gate Resort, which was expected to appeal.)

Many companies are willing to take their chances with an offshore base. "We haven't had any problems," says Jeffrey Erb, vice president of Intersphere Communications, a subsidiary of Interactive Gaming & Communications Corp. (IGC). "What we're doing is not illegal. It boils down to the fact that the United States forgets it doesn't have jurisdiction over the world. We're fully licensed in Grenada."

IGC was the first company to accept a wager over the Net on May 11, 1995. Its WiseGuy sports wagering system has proven successful, and the company recently introduced Global Casino (**http://www.gamblenet.com**), a full-scale interactive casino on the Net. IGC expects its online gaming and wagering to match or exceed the $50,000,000 handled through the company's telephone service.

World Wide Web Casinos, which offers the Net Pirates site (**http://www.netpirates.com**), has a casino on the Caribbean island of Antigua.

Others, like Virtual Vegas (**http://www.virtualvegas.com**), offer casino games without any real money exchanging hands. Games are played with virtual funds.

IGC and other Internet-gambling enterprises are in the process of creating a self-regulating body, tentatively called the Interactive Gaming Council. Sue Schneider, CEO and editor of Rolling Good Times Online magazine (**http://www.rgtonline.com**), says, "We're working on it from a consumer-protection standard ourselves. We're looking to get a seal of approval."

Goals include an accreditation process for online gaming, a monitoring system (to check for a company's financial solvency, for instance), and an arbitration system for consumer complaints.

While self-regulation may sound promising, don't expect state governments to back down. "Self-policing doesn't put them within the confines of the law," says California special assistant attorney general Tom Gede. —*Vira Mamchur Schwartz*

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CIRCLE NUMBER 22

EDUCATION

Bridging the Digital Gap

Last year a historic all-volunteer effort was set in motion to make Internet connectivity an integral part of America's K–12 educational system. NetDay, founded by Sun Microsystems, was created to encourage the private sector to take part in wiring classrooms to the Internet. The first NetDay in California (March 9, 1996) brought together 100,000 volunteers, including President Clinton and Vice President Gore, and connected 4,000 schools to the Net.

Since then, NetDay has grown into a national grassroots initiative in more than 35 states with more than 200,000 volunteers donating their time and technical skills to install telecommunications wiring and modems. Estimates put the value of the work at more than $1,000 per classroom.

This year's target wiring date is April 19 and communities across the country are organizing volunteer groups through NetDay's Web page at **http://netday.well.com**. Visitors who wish to become sponsors or volunteers can click on their states or districts from a map of the United States to get contact information for organizers in their areas.

The site also provides technical installation training from the NetDay Cable Installation Guide, a NetDay How-To Guide, and an instructional videotape available via mail order. Businesses, school groups, or individuals can purchase wiring kits directly from the site. The kits (about $400) contain cable and related hardware for installing two connections each in six classrooms and wiring them to a central point.

One of the goals of this project is to narrow the technology gap between affluent and poor communities. According to the Department of Education, 62 percent of schools in wealthy districts have Internet connections, compared to 31 percent in poorer areas. (Microsoft, for example, currently supports 215 libraries in low-income urban and rural areas by providing free hardware, software, and training. The libraries pay only for the telecommunications costs.)

White House Web Site

President Clinton and Vice President Gore are avid supporters of NetDay.

Another approach, also endorsed by Clinton, is semiannual auctions called Net-A-Thons, which raise funds for Internet-ready computers and Internet access to public schools, and are sponsored by the nonprofit National Educational Technology Initiative. Corporations donate software, hardware, and other items for auction during trade shows such as Comdex.

However, despite initial volunteer efforts, this high-tech "barn raising," as it's been called, is not free for the asking. Maintenance for computer systems for businesses costs an average of $1,000 a year per computer, and government estimates put the cost of linking every U.S. school and library to the Internet at $2.5 billion annually.

Enter the Telecommunications Act of 1996. On Nov. 7, 1996, a joint meeting of state and federal regulators and members of the Federal Communications Commission met to decide what form Internet subsidies would take as required by an amendment in the act. The board voted unanimously for a $2.25 billion universal service fund to subsidize Net connectivity for schools. The subsidy will range from 20 percent to 90 percent, with the cost paid by telecommunications carriers. This translates into higher phone bills for consumers—about $6 a year to the average American's home phone bill. The board's recommendations will form the basis of rules the FCC will issue by May. —*Jim Ivers*

Information Services

Below are important databases now accessible via the Internet, usually by subscription.

Compiled by Susie Davis

DialogLink from Knight-Ridder **http://www.krinfo.com**	Search over 450 databases covering trademarks, pharmaceuticals, market research, and competitive intelligence.
DunsLink from Dun & Bradstreet **http://www.dbisna.com/product/contract.htm**	Retrieves reports such as Business Background, Business Information, Payment Analysis, Supplier Evaluation, and Credit Score products.
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CIRCLE NUMBER 48

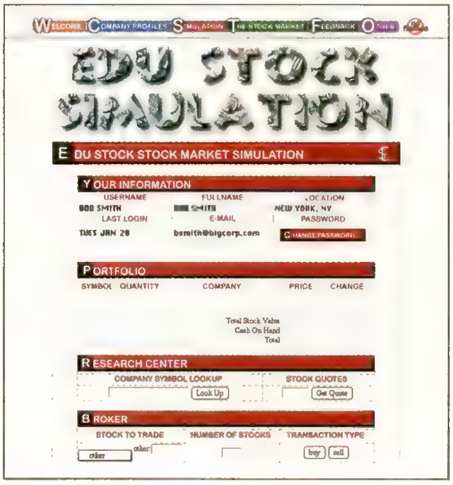
DESIGN CONTEST

The Winner Is . . .

Teams of students from across the country gathered in Washington, D.C., on Nov. 25, 1996 for the annual ThinkQuest awards, an Internet contest that rewards students ages 12 to 18 for their efforts in creating high-quality educational Web sites. Entries covered topics ranging from fine art to Chernobyl to Civil War history. The competition is sponsored by Advanced Network & Services Inc. of Armonk, N.Y., a nonprofit organization devoted to using computer technologies to advance education. The Internet Society pitched in by assembling panels of judges with expertise in the contest's five categories: science and math, arts and literature, social sciences, sports, and interdisciplinary topics.

Walking away with the Best in Contest award was a team from Potomac, Md. (winning $25,000 in scholarships for each team member and $5,000 for their coach), with Economics and Investment: A Stock Market Simulation *(pictured)*, which provides tutorials on stock market investing. All winners and finalists' entries can be viewed at Advanced Network & Services' site at **http://www.advanced.org/thinkquest**. Entries for the 1997 contest are due Jan. 31, and complete rules can also be viewed at the site.

—Amy Dunlop



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TRANSACTION TYPE

TECHNOLOGY

E-Mail by Phone

Millennia Software has introduced Email Reader, software that uses voice synthesis to read e-mail messages to users over a telephone. When prompted, users give voice commands such as "Play Message" or punch corresponding command numbers on their telephone keypads. Users must have a voice modem (available at computer stores for about $150) and leave their computers on to fetch messages.

Email Reader runs on Pentium-based computers using Microsoft Windows 95 and works with any POP3-compliant e-mail package. Version 2.0, due in March, will support the SMTP protocol and will allow users to send "canned" voice messages, with plans for full dictation in the works. Users can download the $89.95 software from Millennia's Web site at **http://www.msw.com**. For more info, call (888) 362-4573.

—S.D.

Doing the Looking

It's not your typical search engine. LookSmart (http://www.looksmart.com), built entirely in Java and from LookSmart Ltd., an Australian subsidiary of Reader's Digest, connects Web surfers to pages of information on specific topics using a graphical point-and-click approach that it says spares users from scrolling through countless unrelated Web sites in order to access information.

LookSmart SM

Teams of editors based in Melbourne do nothing but surf the Web to select sites relevant to LookSmart's general topics, which include Education and Reference, Home and Family, Issues and Society, Sports and Recreation, and more. The database included 112,000 sites at press time.

"We're not looking to index the Web," explains David Dubbs, LookSmart's vice president of marketing, "but to provide the quality and brand name people are probably most interested in. We're trying to make it easier for everybody."

—V.M.S.

Photograph: FPG International

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ET CETERA

InterJet from Whistle Communications is targeted toward small businesses and the nontechnical market. The compact plug-and-play network device is designed to get businesses online with as little effort as possible. The $1,995 product connects to an Ethernet LAN in a one-hour installation procedure that results in Internet connectivity, e-mail, Web-publishing capabilities, and firewall security via a built-in 28.8-Kbps modem, optional ISDN adapter, or faster connection.

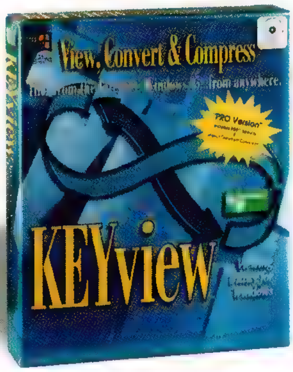
Co-marketed with ISPs nationwide, the InterJet automatically configures and maintains itself. More details are available at **http://www.whistle.com**.

....

Rooms 3.0 from Ichat (**http://www.ichat.com**) will allow Web site creators to turn their online presence into a complete online service with chat rooms and threaded discussions. The software (due out later this year) will allow Webmasters to maintain online communities by adding real-time-chat areas, much like America Online's popular chat rooms, but with additional features such as automatic "nanny" bots to screen out inappropriate language, and IRC compatibility for users who don't have the company's free plug-in. Deals with I/Pro and Net-Gravity will allows corporate users to track visitors for advertising purposes. The 3.0 release will include Usenet News-like threaded discussion areas and will be scalable to the enterprise level. It is available for Windows NT and Unix platforms; pricing has not been set.

....

Centri Firewall 3.1 for Windows NT networks was launched by Global Internet (**http://www.globalinternet.com**). Centri's product is targeted to midsize companies looking to secure and manage multiple interconnected networks; it combines the two most popular technological approaches to network security: packet filtering and application proxy techniques. The system provides "handlers" for all popular Internet-related protocols, highly granular filtering and blocking capabilities, a variety of user-authentication schemes (including SSL), and network-address translation and is bundled with MetaInfo's DNS and sendmail servers. Centri Firewall has an easy-to-use, browser-accessed administration module. The package can be downloaded for free trial use; pricing starts at $5,000 for a 50-user license.



KEYview Pro 5.1 from FTP Software ($99) should hold special interest for serious Net users. The viewing/conversion utility, which already was able to play/display and, in many cases, convert to and from such Web-oriented file types as QuickTime, MIDI, TIFF, GIF, and JPEG, now includes the ability to display MIME attachments, view HTML, and—a boon to those creating and updating Web sites—save a variety of word-processing and spreadsheet native formats as HTML. The software also performs file compression/decompression and provides PGP encryption on binary files sent as e-mail attachments. KEYview has an inline plug-in player for Netscape Navigator and Microsoft Internet Explorer 3.0. Visit **http://www.ftp.com** for more details.

....

NetResults from Innotech Multimedia Corp., one of the first large-scale applications written in native Java, is an industrial-strength search-and-retrieval engine that, by virtue of its Java-code base, operates across diverse computing platforms. The engine will be priced at $1,995 per site. Perhaps the most intriguing promise of NetResults is its client-side flexibility and customization potential. Due to the ease with which Java applets can be created, each organization or workgroup can have a purpose-built client that contains features specific to its needs. Visit **http://www.innotechcd.com** for details.

Innotech
NetResults

....

Cold Fusion 2.0 was introduced by Allaire Corp. (**http://www.allaire.com**). The product lets Webmasters and other HTML adepts create dynamic, interactive pages with a minimum of cost and effort—particularly for data-collection and distribution applications. The system consists of a tag-based markup language, Cold Fusion Markup Language (CFML), and a server-side engine that translates Cold Fusion tags into HTML on the fly. CFML pages can integrate Java and ActiveX components and support both JavaScript and VBScript. The $495 server communicates via API with Netscape, Microsoft, and O'Reilly's HTTP servers and supports all ODBC-compliant databases. —*Amy Dunlop, Andrew Kantor, Ted Stevenson*

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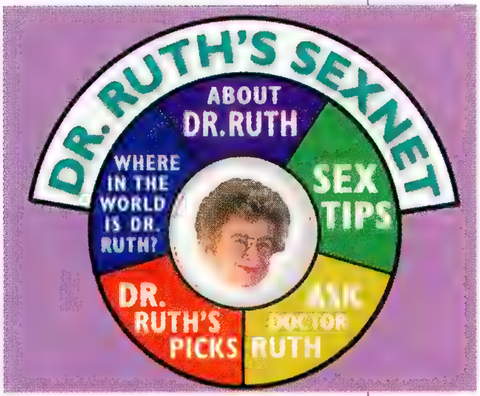
CIRCLE NUMBER 102

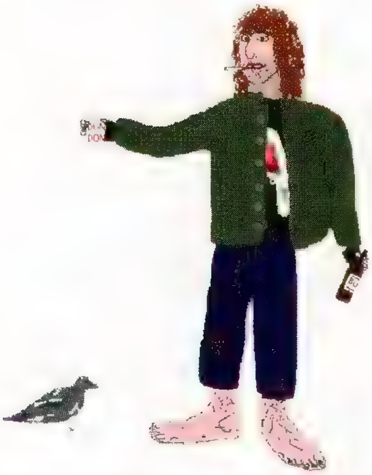
The Surfboard

by Eric Berlin and Andrew Kantor

THERE ARE 40 MILLION STORIES ON THE NAKED INTERNET. HERE ARE SOME OF THEM.



You can see why the makers of See-and-Say were a little upset with Dr. Ruth.



Panhandlers are common in the city, and now at least one (above) is online.

Bummer

If you've got some spare change and want to know what it's like to live in a big city, just head over to **http://www.panhandler.com**. There you can meet the Virtual Panhandler and, well, give him some of your money.

Since its inception this past May, the Virtual Panhandler has scrounged up exactly $6.12, plus a packet of Gummi Bears. (After all, if you can't give money, please give food.) Perhaps the Panhandler has met with only limited success because you either have to send cash via snail mail or put your donation on a major credit card. And would you give your credit card number to a stranger on the street? Probably not.

The site's programmer, John Reid Greco, is apparently solving the problem by establishing still more online beggars. (Increasing one's sales force should increase one's revenue, we suppose.) Perhaps the VP should think instead about setting up a CyberCash account. Or, alternatively, getting a job.

Judgment Call

You've probably heard about the Maynards/Massey brouhaha. The Maynards run Internet America, an ISP in Dallas, and got into a nasty Usenet flamewar with Kevin Massey. The nastiness started in a flame-based newsgroup, but then spilled over into the more mainstream **dfw.internet.providers**, at which point the Maynards shouted "harassment!" (Harassment having lost its punch in the news, it was remade into a case of the more newsworthy "stalking"; check out the Nov. 4, 1996 *U.S. News and World Report*.)

This mess notwithstanding, the case was groundbreaking in one way: Judge Joe Brown of Dallas County Judicial District Court, whom the Maynards asked to issue a restraining order against Massey, granted that order by sending Massey e-mail and posting it to Usenet. (At the time, they had no postal address for Massey.)

Is that legal? Legal enough for the Maynards, whose attorney said that "under Texas state law, whenever a person has knowledge of an order, that is sufficient notice." Still, the invective continues between the two sides and we doubt it will be over any time soon. Read all about this one . . . online.

A Different Kind of Toy Story

In the department of "Two Entities We Previously Never Thought Knew of Each Other's Existence" we have Dr. Ruth Westheimer, the diminutive sex advisor, and Mattel, the giant toy company, who recently settled a small legal matter. The problem? It seems that the home page of Dr. Ruth's Web site (**http://www.drruth.com**) resembled a See-and-Say, a Mattel toy that normally has a variety of animals and words on it. A two-year-old using the toy would spin an arrow to a cow, which would then say "Moo." Needless to say, on the Dr. Ruth version of this toy, there was not a cow to be seen; instead, it had sections like "Sex Tips." (We would have paid money to have been in the room when the Mattel execs saw it for the first time.)

Mattel's lawyers made the obvious legal grumblings, and Creative Multimedia Corp., the brains behind the site, jumped. While the lawsuit was not technically settled as of this writing, Michelle McShane, a lawyer for Mattel, said the Web page was no longer an issue. (Presumably, Creative Multimedia must now promise never ever to do something like this again.) Anyway, the interface for Dr. Ruth's site has been redesigned. It now looks like a giant Etch-a-Sketch. No, no, just kidding.

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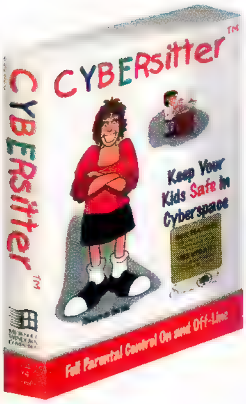
CIRCLE NUMBER 34

The Surfboard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Censoring the baby along with the bathwater, Cybersitter is happy to take charge of your kids' morality.

Watching the Watchmen

If you still think only the "bad stuff" is being blocked by those Web-filtering programs, think again (see "Who Will Watch the Watchmen?" Nov. '96 Surfboard).

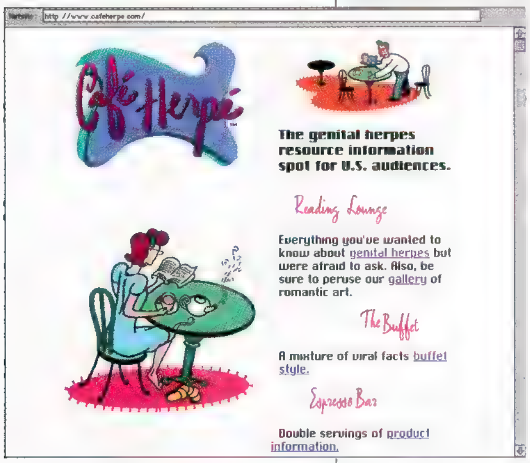
When we learned that The Well—the big San Francisco-based ISP—was now being blocked by Cybersitter, we asked why. The answer: "They are one of the most disgusting servers out there," says Marc Kanter, director of marketing for Solid Oak Software, makers of Cybersitter. "They don't monitor their customers and they allow pornography."

Brian Melburn, director of product development, added, "They have a lot of pages dealing with homosexuality and marijuana." Um, OK, fine, but what about all the benign Web pages that are also being blocked at The Well and approximately 20 other ISPs? That turned out to be the $64,000 question. "Our product is aimed at the preteenager," says Melburn. "If a page on quantum mechanics is inadvertently blocked, it generally never comes up as an issue because kids never try to get to it anyway."

They certainly never will now, although we have to wonder what else besides quantum mechanics the censorware companies consider unimportant. Evolution? Calculus? The Vietnam War?

So, despite its claims, Cybersitter doesn't block *out* the bad stuff. It lets *in*, by its definition, the good stuff. The distinction is subtle, but important: The company is saying, essentially, "We know what your kids need to see. And they can only be as curious and as adventurous as we believe they should be."

Cybersitter still beats having the U.S. government coming in and regulating things . . . but not by much.



The genital herpes resource information spot for U.S. audiences.

Everything you've wanted to know about genital herpes but were afraid to ask. Also, be sure to peruse our gallery of romantic art.

A mixture of viral facts buffet style.

Double servings of product information.

Online coffee shop or genital herpes resource? It's both!

Sore Point

There's tacky, and then there's SmithKline Beecham, which has presented the Internet with Café Herpé—**http://www.cafeherpe.com**. The name says it all; it's "The genital herpes resource information spot for U.S. audiences." Now don't get us wrong: We have nothing against sites offering medical information about anything imaginable (or even unimaginable). It's not the content that had our eyebrows raised—it's the presentation.

Café Herpé is designed to offer a "coffee shop"-like experience for people to discuss the disease, although we can't say that the local Starbucks is the place we'd turn for this stuff. It features cheerful graphics, including several people sitting—alone—at tables in the café. There's also, we kid you not, a "gallery of romantic art" featuring a handful of Renaissance-era nudes. Unfortunately, the graphics are so small we couldn't tell . . . never mind.

We can't help but look forward to the Online Hangnail Festival and Athlete's Foot-A-Rama, opening soon.

"Rats," said BBN when 400 customers lost their connections.

Ratted Out

Bugs in the system are one thing, but rats are another—just ask customers of giant network service provider BBN. Over 400 lost their Internet connection when one of the pesky rodents tangled with one of Stanford University's power systems, knocking out the electricity to one of BBN's points of presence. Although only 400 customers were affected, we're not talking 400 individuals—BBN is a provider's provider, so the actual number of people affected is hard to determine.

(Probably trying to avoid the embarrassment of an explanation, the BBN press release said simply, "An electrical power outage at the Stanford University complex has caused BBN Corporation's Internet access in Palo Alto, Calif., to be temporarily unavailable. . . ." But the rat story got out, and, as will happen, the truth quickly circulated.)

Legend has it that the Internet was originally designed to survive a nuclear war. Maybe so, but the designers might have been better off not looking up for trouble, but down.

Eric Berlin is a freelance writer and playwright in New York. Andrew Kantor is senior editor of Internet World. *They can be reached at* **surf@iw.com**, *although only one of them has a real job.*

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By Cynthia N. James-Catalano

DOCTOR'S ADVICE

You can tap into a growing cadre of medical experts who are dispensing advice online for free—with no appointments and no waiting rooms.

Doctors often dread telling others their profession when at a party. Utter the words "I'm a doctor" and it isn't long before someone is describing his medical symptoms, eagerly awaiting a diagnosis. It happens to nurses as well. Neighborhood children are brought over for a quick once over when the parents want a medical opinion without making an appointment to see the doctor.

You'd think the Internet would be the last place doctors and nurses would want to announce their profession; imagine getting e-mail from around the world asking for health advice. However, there is a growing number of health-related resources coming online to offer free medical help. And ask-a-doctor services are just the beginning. You can query general practitioners or specialists from a wide range of medical disciplines.

This online help isn't meant to replace a visit to your local doctor. No matter how well you describe your symptoms, it cannot take the place of a physical examination. However, there is a lot of useful information that can be gleaned online. You can get answers to basic questions, learn about alternative treatment options, and get more information about a particular symptom or condition.

THE DOCTOR IS IN

You can consult a health-care professional for medical advice in a variety of areas without having to leave your home or office. Medical HouseCall at **http://www.familyinternet.com/mhc** is a good place to start for quick answers to common questions. It's divided into subjects such as symptoms, drug interaction, nutrition, and common injuries. If you'd like to ask a specific question, try Ask the Doctor at **http://www.health-net.com/ask.htm**. You can read previously asked questions and answers (which can save you time if your query has already been answered), search by keyword, or browse through the subject listings. You can also link back to Medical HouseCall from here.

Another Ask the Doctor page is Drug InfoNet at **http://www.druginfonet.com/askmd.htm**. It provides a detailed form for you to make a specific request. Your medical question will be answered by doctors who are "practicing, board-certified, and not affiliated with pharmaceutical manufacturers." Frequently asked questions are posted in subject categories such as "thyroid" or "allergies"; the inquirer's identity is kept anonymous. Replies may take longer than a few days because more than one doctor could review your question.

If you have children, you probably spend more time at the pediatrician's office than your own doctor's. And lots of questions undoubtedly occur to you when calling the doctor isn't feasible. Anxious parents can get answers from the Web Doctor (**http://www.parentsplace.com/readroom/dr_answers.html**) at ParentsPlace.com, where pediatrician Robert Steele answers questions concerning children's health. Questions and answers are posted to this site, and there is a searchable archive of previous questions and answers. The archive is divided into subjects for easier browsing.

At Ask Tori, R.N. (**http://www.storksite.com/public/asktori.html**), registered nurse Tori Kropp answers questions concerning pregnancy and baby care. The most recent questions are posted and you can search the archive for previous ones. However, you have to register to conduct a search.

Ask-A-Doc is part of the Medical Mall at **http://www.rain.org/~medmall/ask/asklandon.html**. Dr. Chris Landon, a pediatric specialist, answers medical questions and posts them to this site. Questions and answers are divided into subject categories and are organized into a table. Other doctors might answer the question or add to Landon's answer when appropriate. E-mail questions are encouraged.

SPECIAL ATTENTION

Besides the general practitioners, doctors and registered nurses are available who specialize in specific areas. For example, you can ask a pharmacist for information on medications or get dietary advice from a registered dietitian. Psychologists are online to answer questions concerning mental health issues as well. And

Image by Kristi Worden

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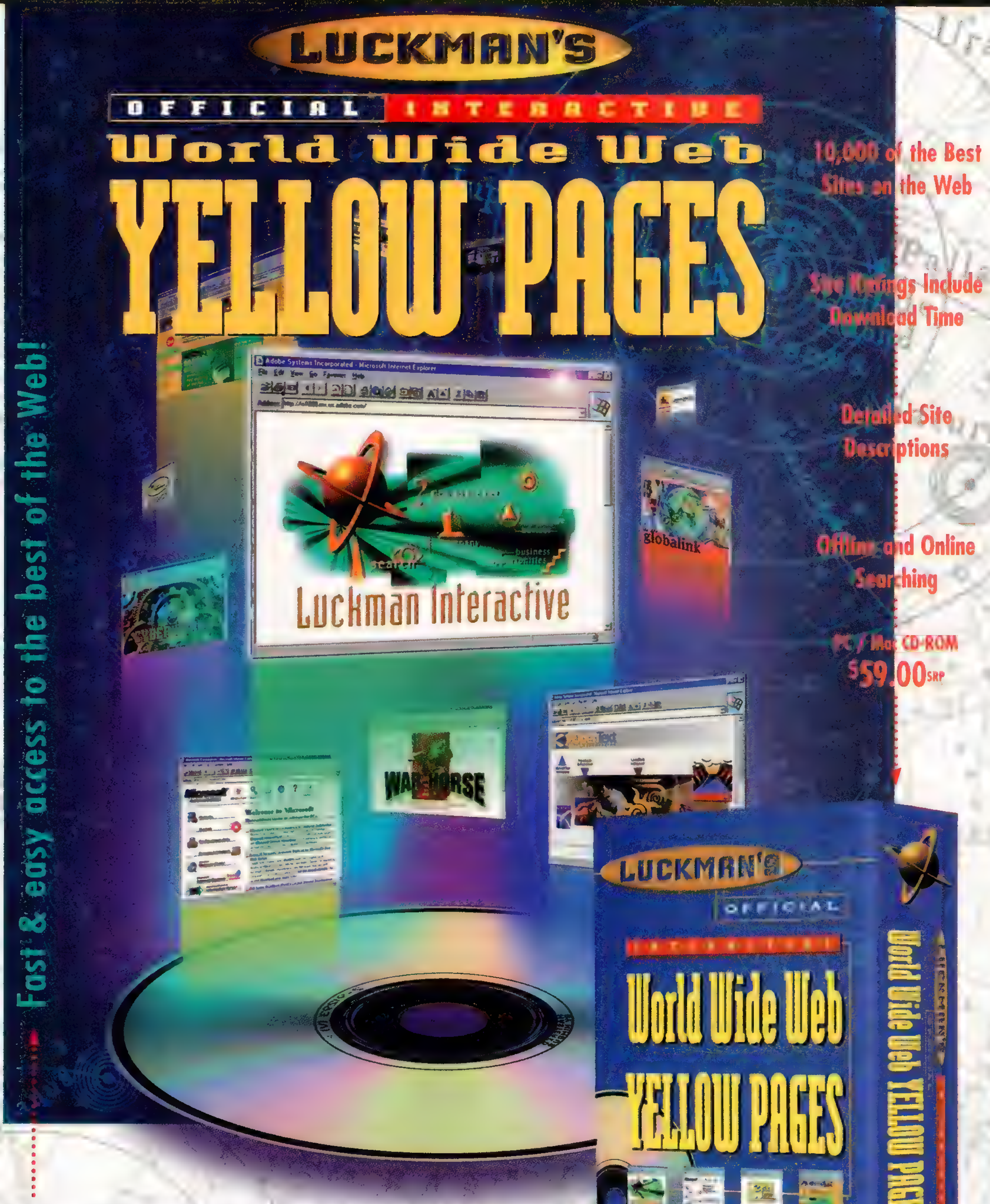
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CIRCLE NUMBER 40

don't forget that dentists are doctors, too—and several have made themselves available to the Net community.

One frightening disease women face is breast cancer. If you need information or support, visit About Breast Cancer at **http://sadr.biostat.wisc.edu/bca/ask.html**. Questions are answered by information specialists via e-mail within a couple of days. Funded by the National Cancer Institute, the site also gives you a phone number to call for more information. And there's a link to the Breast Cancer Answers home page, which includes a FAQ list.

INTERNET MEDICAL PROFESSIONALS CAN HELP YOU WITH SECOND OPINIONS AND ALTERNATIVE TREATMENTS.

For hemophilia queries, Dr. Clothilde of the World Federation of Hemophilia answers questions at **http://www.wfh.org/doc.html**. Questions and answers are posted and organized into subject categories.

The Children with Diabetes site at **http://www.castleweb.com/diabetes/d_0d_000.htm** is one place parents can get more information about this condition. Doctors and nurses answer questions concerning children who have been diagnosed with diabetes. (Some questions about adults get slipped in, too.) Questions and answers are posted to the site and the archive is arranged chronologically. You can decide whether to include your e-mail address in the post so that others who read the message can respond to you. However, names are not included.

Young and old can suffer from arthritis, although this condition seems to affect the elderly the most. The Arthritis Foundation (AF) sponsors Ask A Question at **http://www.arthritis.org/forms/ask.help.html**. A detailed form helps you pose a precise question, and experts can answer via e-mail or call you. You also can link to the AF home page, which has a FAQ list.

Couples having trouble conceiving a child need support and information on several levels. While medical advice is one aspect, counseling in social and emotional areas can also be beneficial. Fertilitext, at **http://www.fertilitext.org/Question.html**, helps answer the medical questions. Doctors and nurses in the field of infertility treatment will answer queries via e-mail. Although not anonymous, the service is kept confidential. The Fertilitext home page (**http://www.fertilitext.org/Welcome.html**) offers a wide array of information on the subject, including news updates, medications, treatments, and referrals to various services. Lifetime Online: Resolve Ask The Expert at **http://www.lifetimetv.com/parenting/RESOLVE/expertad.html** offers a nurturing environment for frustrated would-be parents. Resolve is a nonprofit organization founded in 1974 to help people facing infertility. (Resolve's home page is at **http://www.resolve.org**. The Ask the Expert page is part of Lifetime Online's Parenting section.) A medical professional answers questions, but most of the posted queries concern people's feelings about their infertility rather than the medical aspects of treating it. For example, one woman asked how to deal with baby showers when facing her own inability to have a baby.

IS IT SAFE?

Although you can't get your teeth cleaned on the Internet, you can ask questions that will help you determine whether it's time for a trip to the dentist's chair. Ask Dr. Tooth at the Dentistinfo.com page (**http://www.dentistinfo.com/aska.htm**) offers a friendly environment to learn more about dental care. There's a bit of a wait because of the volume of questions, but you can participate in a chat session with dentists while awaiting your answer.

Dr. Kimberly A. Loos of Ask the Dentist (**http://www.parentsplace.com/readroom/dentist**) answers questions primarily from parents concerned with good dental hygiene for their children. Questions and answers are posted to the site in easy-to-follow subject categories. You can search through an archive to see if your question has already been answered. The Dentist Zone at **http://www.dentistzone.com/dds/dds_ask.htm** will guide you to other resources if you still have questions you want answered. This page features links to other dentists, general dental information, dental schools, and more.

Are you worried that your vision is getting blurry and it's not just from the hours you spend staring at a computer monitor? Send your questions to Ask the Optometrist, part of Internet VisionCare, at **http://www.visioncare.com/ask.htm**, where Dr. Steinberg will answer questions via e-mail. There's a form to help narrow your query, and you can read the FAQs for general guidelines on exams and simple explanations of common vision problems and treatments.

At Mental Health Interactive's Ask the Expert (**http://www.mhsource.com/interactive/interactive.html**), Dr. Ron Pies responds to psychology queries. Recent questions and answers are posted to the site, and a searchable archive allows you to read previous questions.

You get home with your prescription and realize you don't remember what your doctor told you. Were you supposed to take it with milk or on an empty stomach? Maybe you forgot to tell your doctor about the vitamins you've been taking and now you're concerned whether they will interact with your new medication. Although you should check with your doctor about any serious concerns, you can learn more about drugs and their effects at Ask the Pharmacist (**http://www.wilmington.net/dees**). Frank P. Purdy answers questions concerning prescribed medications and there's a small FAQ section and a form to fill out for queries. Purdy also will answer questions via e-mail. A database of medications in planned for the future.

Of course, one of the best ways to avoid the doctor is to stay healthy in the first place. As your parents probably told you, eating right is one of the best ways to keep well. You can get dietary advice from Ask the Dietitian (**http://www.hoptechno.com/rdindex.htm**), where Joanne Larsen, a registered dietitian with over 20 years of experience, answers questions of general interest. Answers are posted to the site and are divided into topics for easy access. She is unable to give personal replies because of the volume of e-mail.

Once again, while online medical advice does not replace the care of your physician, these Internet medical professionals can help you with second opinions, alternative treatments, and general information. The more you know about your body, the better you'll be able to stay healthy. Using these online forums may also help you form questions to ask your doctor, and you can be reassured when the Internet doctor confirms your own doctor's diagnosis. Medical professionals already use the Internet to keep in touch and share treatments. You can tap into this growing online community as well. Here's to your health! ■

Cynthia N. James-Catalano (jamcat@iag.net) is an editorial researcher in Orlando, Fla. She has a master's degree in library science.

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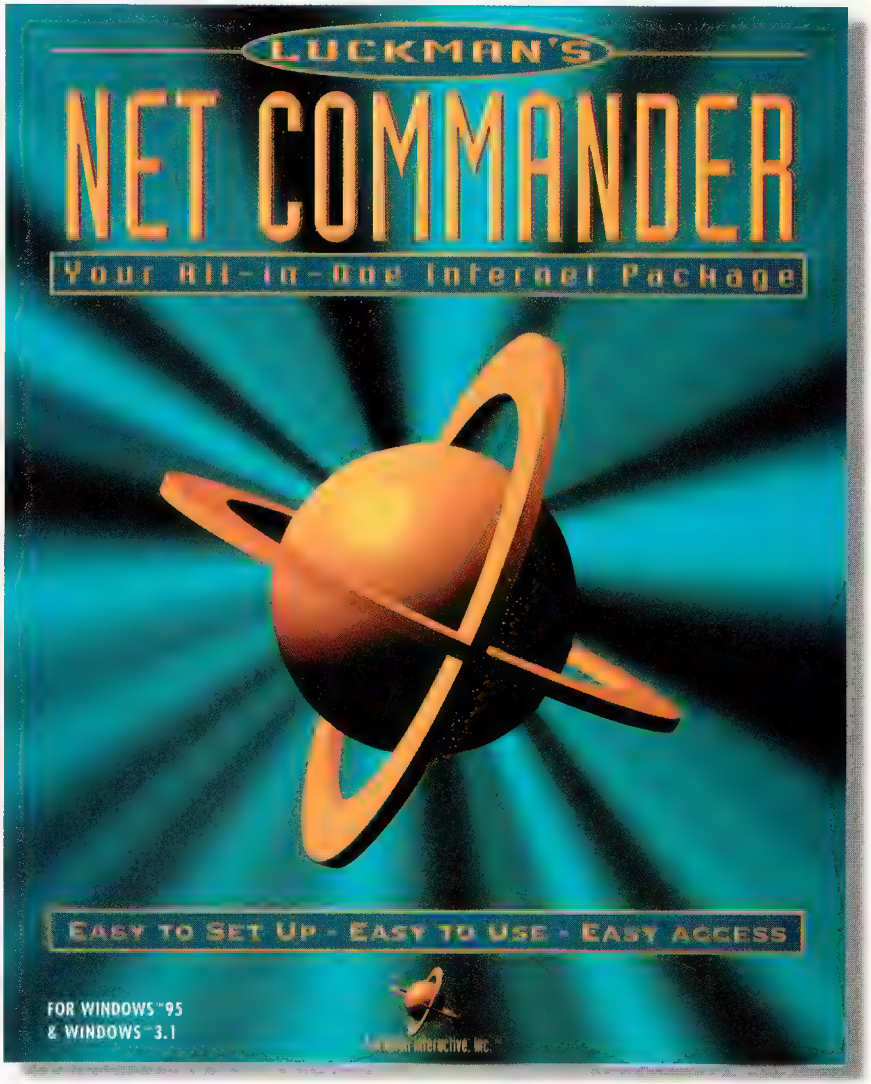
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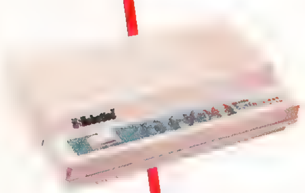

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CIRCLE NUMBER 26

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By Rosalind Resnick

MARKETING RIDDLE

How do you increase your online reach? The Riddler, Link Exchange, and TipWorld use models that play to the Internet's cooperative culture.

For those of us in the Internet business, the solution to every marketing problem seems to be more and better technology. From browsers that don't crash to "wallets" that jingle with digital coins to software that serves up banner ads to demographically targeted viewers, the solution always seems to be new and improved bells and whistles.

Late last year, DoubleClick (**http://www.doubleclick.net**), the Internet advertising network, released a new software add-on called ClickBoosters that aims to increase Web advertisers' click-through rates by scouting for visitors who are new to seeing a particular ad and thus, presumably, more inclined to click on the banner and check out the advertiser's site.

Now, I'm not saying that DoubleClick's plan won't work, but there are plenty of grassroots marketing techniques out there that can reap impressive results for Web publishers and marketers. The reason: Long before the Internet became a widespread medium, it was a cacophonous community of independent-minded individuals debating, collaborating, and sharing news and ideas. The Internet wasn't always inhabited by big corporations and media conglomerates. It was once populated by thousands of computer enthusiasts with a story or software to share. The entry of mainstream computer users has changed the Internet's culture and made commerce more acceptable, and in turn these "newbies" have been affected by Internet culture as well. That's why the marketing and publishing techniques that often work the best on the Net are those that tap into Internet culture and values.

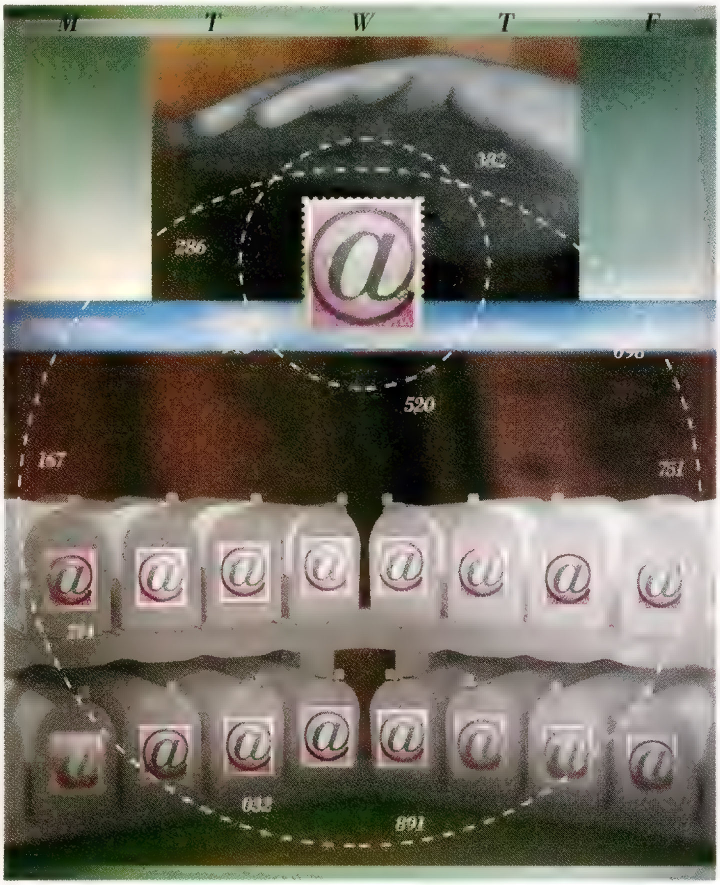

Illustration by Stuart Bradford

CONTENT SYNDICATION

In the newspaper business, syndication is as old as moveable type. *Peanuts*, Dear Abby, *Doonesbury*, *Dilbert*, and other comics and features are staples of print-newspaper publishing and are household names to millions of readers. These days, leading syndicates like United Media are bringing features like these to the Internet, but that's not even the big story in Web syndication.

To see the future of syndication on the Net, check out the Riddler gaming site at **http://www.riddler.com**. Recently, Riddler's developer, Interactive Imaginations, announced content syndication deals with leading Web publishers, including Infoseek, Firefly, @Home, Hollywood Online, The Princeton Review, Travelocity, Starting Point, CEA, and others. Each of these sites has signed co-marketing agreements that provide customized versions of Riddler's games that will be co-branded and promoted on their sites.

Riddler, for those of who haven't visited it, is a Web site that lets players compete for cash and prizes in various games of skill, including multiplayer trivia, crossword puzzles, and scavenger hunts. Prizes range from Random House books to Ford Explorers. One of the most popular sites on the Web, Riddler has attracted more than 185,000 players and awarded more than $325,000 worth of prizes in its almost two-year history. The idea is to collect lots of juicy demographic data about the players and to serve it up to advertisers eager to flash their banners at target markets.

"By syndicating Riddler game content to other premier Web sites, we're able to build our exposure to Web consumers while providing partner sites with additional content to hold consumer attention at their site," says Lawrence Hedblom, Riddler's director of market development. "The cross-promotional agreements generate additional traffic and advertising revenue for both parties and are an example of the cooperative and collegial atmosphere among the relatively new

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CIRCLE NUMBER 8

Internet companies that are partnering to secure a foothold in the electronic frontier."

In some cases, publishers get to display one banner on Commonwealth (a banner-advertising network operated by Interactive Imaginations) for each Riddler banner they display on their own site. In other cases, Riddler and the publisher split advertising availabilities, with the publisher getting the opportunity to sell a banner on the co-branded welcome page, and Riddler delivering additional full-page ad views for its sponsors. Hedblom says there's no money changing hands in these deals, but that Riddler is looking for a six-month commitment from publishers who want to test the concept.

COMMERCIAL PUBLISHERS HAVE A LOT TO GAIN BY TAPPING INTO THE NET'S GRASSROOTS CULTURE.

"What we're trying to do is get some partnerships started that we can build on," Hedblom adds. "This is the beginning of relationships that we hope can expand."

BANNER SWAPS

One of the painful realities of Internet publishing is that while most of the information delivered online is free, so is the majority of the advertising. While major search engines and a handful of other popular sites are capturing the lion's share of the ad dollars being spent on the Net, thousands of smaller sites must make do with soft-dollar link exchanges in which sites drive traffic each other's way for free.

Now, it seems, a network of 35,000 of these smaller sites—plus some larger ones—is about to reach critical mass. Launched in March 1996, the Internet Link Exchange (**http://www.linkexchange.com**) is currently delivering two million impressions a day and growing at a rate of 15 percent a week, according to Judith Blackwell's *Cyber-Marketing Letter*. Link Exchange members exchange banner space on their Web pages for free placement of their banners elsewhere on the network.

In return for providing this service, Link Exchange retains part of the total ad inventory to advertise the network and sell to paying sponsors. Of the total number of ads available on the network, roughly half are open to paying advertisers while the other half are reserved for members. The Link Exchange's ad rates range from $7.20 to $8 per thousand hits (CPM), far lower than the $25 to $30 CPM charged by search engines and the $75 to $150 CPM charged by content sites like C|net and HotWired.

One of the reasons for Link Exchange's rapid growth is that it taps into the Web's you-scratch-my-back-I'll-scratch-yours cooperative business culture. Each time the system displays a banner on a member's site, the member automatically receives one half credit in its Link Exchange account. For every full credit an account earns, the system displays the member's banner on another member's site.

With 500 new Web sites joining every day, the Link Exchange says it expects to reach a traffic level of 10 million ad impressions a day by the end of the year. It also boasts a higher-than-average click-through ratio of about 3.2 percent, or roughly 31 to 1, on untargeted ads. Currently, the Link Exchange lacks the ability to target Web users by interest or demographics that DoubleClick has, but the company says it is beta testing targeting software on several of its members' sites.

If banner advertising proves itself to be a viable business model (and from previous columns you know that I'm skeptical about this), the Web-advertising market will be large enough to support several advertising networks, especially one that taps into the bottom-up populism that has fueled the Internet's growth.

E-MAIL NEWSLETTERS

In early 1994, the Web was a place for physicists and Gopher sites. Then came Netscape Navigator, banner advertising, and, well, the rest is Internet history. While e-mail newsletters like Seidman's *Online Insider* (**http://www.clark.net/pub/robert/listserv.html**) still thrive, they've been overshadowed by big-budget productions from the likes of Time Inc., Dow Jones, Starwave, and other media powerhouses.

Or so I thought—until I got wind of TipWorld (**http://www.tipworld.com**), a cluster of free e-mail newsletters that bills itself as the Internet's No. 1 source for computer tips, news, and gossip. Jointly published by the IDG Newsletter Corp. (**http://www.idg.com**) and *PC World*'s Online Services Group (**http://www.pcworld.com**), TipWorld boasts more than 300,000 controlled-circulation subscribers and ranks as one of the top online computer publishers.

When users visit the TipWorld site, they are invited to subscribe to one or more computer-related newsletters, which are then automatically delivered to their e-mail boxes Monday through Friday. TipWorld readers get timely bits of information about their choice of 15 topics such as Windows 95, Bug Reports, Cool Web Sites, and an Internet soap opera.

According to IDG, the retention rate of TipWorld readers averages 83 percent a month, which is outstanding for a controlled-circulation publication. The newsletters' subscriber base is growing by 7 percent to 9 percent a week, and the circulation is expected to grow to more than one million daily readers by Oct. 1, 1997.

Because of TipWorld's large audience and its "politically correct" marketing strategy of sending Internet users only information they request, the newsletters have begun to attract the attention of major technology advertisers such as Microsoft. TipWorld advertisers get half-screen ad banners on each sign-up page plus text-only sponsorship blurbs included in each tip broadcast. TipWorld ads are $30 CPM with a minimum buy of 100,000 impressions, or $3,000.

What I like about TipWorld is that it mirrors the Internet's traditional structure of newsgroups and mailing lists in which users organize themselves according to lifestyles and interests. I think that TipWorld will be a winner for readers and advertisers alike.

While I'm not advocating a return to the bad old days of Internet publishing, when information was free as long as you could figure out what Unix command to type at the system prompt, I think commercial publishers have a lot to gain by tapping into the grassroots culture that spurred Internet growth.

Until the Web becomes a high-bandwidth mass medium like television (if it ever does), online publishers need to recognize that cooperation will get them further than competition and that low-tech solutions like e-mail can often deliver targeted audiences far more effectively than big-budget advertising tools.

The Web is not TV; it's a lot more like direct mail. So don't believe the hype you read about the Internet becoming a mass market. The real money to be made on the Net today is through one-to-one marketing. Bank on it. ■

Rosalind Resnick (rosalind@netcreations.com) is editor and publisher of Interactive Publishing Alert *and co-author of* The Internet Business Guide *(SAMS, 1995).*

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CIRCLE NUMBER 32

By Niel Robertson

DIRECTING TRAFFIC

Does your site handle traffic effectively? Will it scale up? Site-analysis and load-balancing tools can help you anticipate and fix problems.

As the commercial Internet matures, two key issues are quickly converging. First, user traffic is increasing exponentially, and second, Web sites are becoming fundamental components of many businesses' market presence. To companies serious about how customers experience their Web sites, the interdependence of these issues should not be ignored. Set aside content and aesthetics for one moment and ask yourself two simple questions:

- What is the experience I deliver to visitors via my Web site?
- How will that experience be affected if my Web-site traffic doubles?

Many people spotcheck the performance of their Web site locally. They fire up Netscape, enter their home-page URL, and time how long the page takes to appear. The results of simple experiments like this might be encouraging, but can be deceiving for a number of reasons.

First, many people forget to flush their browser's cache. Caching is a mechanism used by a browser to speed up your Web surfing. The browser simply stores frequently requested HTML pages and images—such as your company's home page and logo—locally on your computer. In fact, if you frequent a site on the Web, what you see in your browser may well have been pulled completely from data cached locally.

Also, most spot checks don't dig deeply enough. It's worth your while to test more than how long it takes to access your home page. Think about how a customer might typically travel around your Web site, then follow the same path yourself. Depending on how your site is set up, the time it takes to view a series of pages will probably be very different from the total time it takes to access the same pages individually. Many Web servers also cache pages and images, and the response time for some pages may be significantly different than for others.

Local spot checks also can be misleading because the path you take to a resource on your own Web site from within your company's intranet is probably a lot shorter, with fewer hops, than the path your customers take, most likely through a busy Internet service provider (ISP). If your visitors reside within a corporate intranet, their requests are probably coming through a proxy server as well, resulting in even more hops.

Proxy servers sit between a corporate intranet and the public Internet. When a user wants to visit your Web site, the request first goes to the proxy server, which makes the request to your Web site. The proxy server collects the data from your Web server and forwards it to the user who requested it. Some ISPs use proxy servers to route Internet requests.

A third factor that can distort spot checks is the speed of your own network connection. If your corporate intranet is connected to a T1 line with a capacity of 1.55 Mbps, you can retrieve data from your Web server much faster than an end user using a 28.8-Kbps modem over a noisy phone line. Multiplying the time it takes you to retrieve your home page on a T1 line by the difference in network-connection speeds gives you only a rough estimate of the difference in performance. And if your Web site attracts a diverse group of users, you'll have to provide acceptable performance for users with 28.8-Kbps, 14.4-Kbps, and 9.6-Kbps modems.

The good news is that some Web-server vendors have the foresight to record your visitors' timing information for you. The bad news is that it's usually hard to get at the information. If your Web server records the information in its logs, you will see for each entry in the log the time it took to transfer the data for that

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CIRCLE NUMBER 30

request. Keep in mind that timing data collected by your Web server is raw information. To make sense of the data—especially on a busy site—you'll probably want to use a log-analysis tool that breaks apart the information in a more meaningful way (see "Stalking the Elusive Usage Data," Web Watch, April 1996 *IW*).

USE ONE OF THE FEW LOAD-TESTING TOOLS TO SIMULATE DIFFERENT SCENARIOS OF CHANGE AND GROWTH.

If you really want to find out how your end user experiences a visit to your site, call a friend on the other side of the country and have him or her call up your site at different times of the day and time how long it takes to retrieve your home page and a couple of pages after that. You may be surprised at the numbers.

GAUGING CHANGES

Hopefully, your friend confirms that your Web site is performing at acceptable speeds. But things on the Net have an odd way of not scaling linearly. Will performance continue to be acceptable when twice as many people visit your site? Fortunately, there are tools on the market to help you analyze your setup, simulate possible increases in usage, pinpoint scaling bottlenecks in your system, and even help you build a site with the ability to scale up to meet ever-increasing traffic.

The first thing you should study is how your site currently is being used. The more you know about your site's usage, the better equipped you will be to fine-tune it and prepare for upgrades. The log-analysis tools on the market today, such as E.G. Software's AuditTrack, Intersé's Market Focus 2, I/Pro's NetLine, and net.Genesis's net.Analysis Pro 2.0, can help you understand usage patterns and tell you what areas of your Web site attract the most traffic. Moreover, these tools can tell you how different parts of your site are being used proportionately. This is important because the way your Web server reacts to twice as many people searching your product database may be quite different from the way it reacts to twice as many people requesting the home page.

These tools also give you the ability to look at trends in usage and performance at a site. Analysis of usage trends for the past three or six months can tell you if your traffic is doubling every quarter, month, or week, and how usage patterns are changing over time.

SIMULATED ACTION

Once armed with a thorough understanding of the current picture, you can use one of a few load-testing tools to simulate different scenarios of change and growth. Most of these tools provide a relatively good degree of flexibility in creating realistic scripts of how users move around your site. Once you've recorded a few common scenarios, the tool can simulate any number of simultaneous users performing the same actions.

The more sophisticated simulation tools let you watch in real time how your server's performance degrades as more simulated users visit your site. By intentionally overloading your Web site and carefully watching the real-time meters, you can identify the number of users at which your site's performance falls below reasonable levels. Use this information, coupled with trend information from an analysis tool, to estimate when it will be time to upgrade.

Load-testing software is an invaluable tool when trying to determine exactly where your Web server has bottlenecks. Server bottlenecks can occur in different areas: server software, memory, CPU, disk speed, and network bandwidth. If memory appears to be the problem, your performance problems could be averted by installing more of it. If your network bandwidth is the limiting factor, you may have to upgrade your network connection.

One load-testing simulation tool is SQA LoadTest (**http://www.sqa.com/product/sqaweb.html**), which checks all components of a browser-based application, including Java applets, JavaScript, and plug-ins that run on the client and server. Another tool, WebLoad from RadView Software Ltd. (**http://www.radview.com/Products/WebQualify/instload.html**), assesses Web-application performance under user-defined variable system loads by running tests that can be generated remotely from multiple client workstations.

LOAD-BALANCING TOOLS

At some point, traffic to a Web server may get too high for one computer to handle effectively. The obvious solution to handling a heavy traffic load is to put another computer to work. A simple solution, called a mirrored site, takes all the Web site resources on the existing server, mirrors them onto another computer, then splits the traffic. This is, in fact, how a lot of the larger sites currently handle millions of hits per day. There are a number of ways to split the traffic, but two common methods are round-robin DNS (Domain Name Server) and dynamic IP (Internet Protocol) redirection.

IP addresses (for example, 206.45.67.100) are based on a hierarchy that helps one computer find another computer on the network quickly. In round-robin DNS systems, the Web-server name is associated with a list of IP addresses. Each IP address on the list maps to a different computer, and each computer contains a mirrored version of the Web site. Whenever a request is received, the Web-server name is translated to the next IP address on the list. By translating Web-server names to IP addresses in this round-robin fashion, requests can be load-balanced to multiple computers.

In the second common method, dynamic IP redirection, the main Web server takes all requests for the Web site's home page but the visitor's browser is redirected to another URL to satisfy the request. The magic here is that the redirected URL could be on the same computer as the main server or any one of several back-end mirror computers. The main server redirects the traffic to back-end Web servers based on their current loads.

Many original megasites had to create their own load-balancing software. But with load balancing becoming an issue for more Web sites, out-of-the-box solutions have come to market. A tool from HydraWEB Technologies (**http://www.hydraweb.com**) provides fault-tolerant load-balancing across multiple servers, intelligently routing large volumes of HTTP requests to the most-available server to optimize performance. Cisco Systems also offers Internet scaling solutions (**http://www.cisco.com/warp/public/751/lodir/swww_wp.html**).

The mind-boggling increase in Web traffic bodes well for Internet commerce. To keep pace with such explosive growth, serious Web site owners must understand current usage, traffic, and performance trends to ensure that their customers' Web experience remains as satisfying as their experience of any other facet of their business. ■

Niel Robertson (nielr@netgen.com) is a software engineer at net.Genesis Corp., an Internet and Web software development firm based in Cambridge, Mass.

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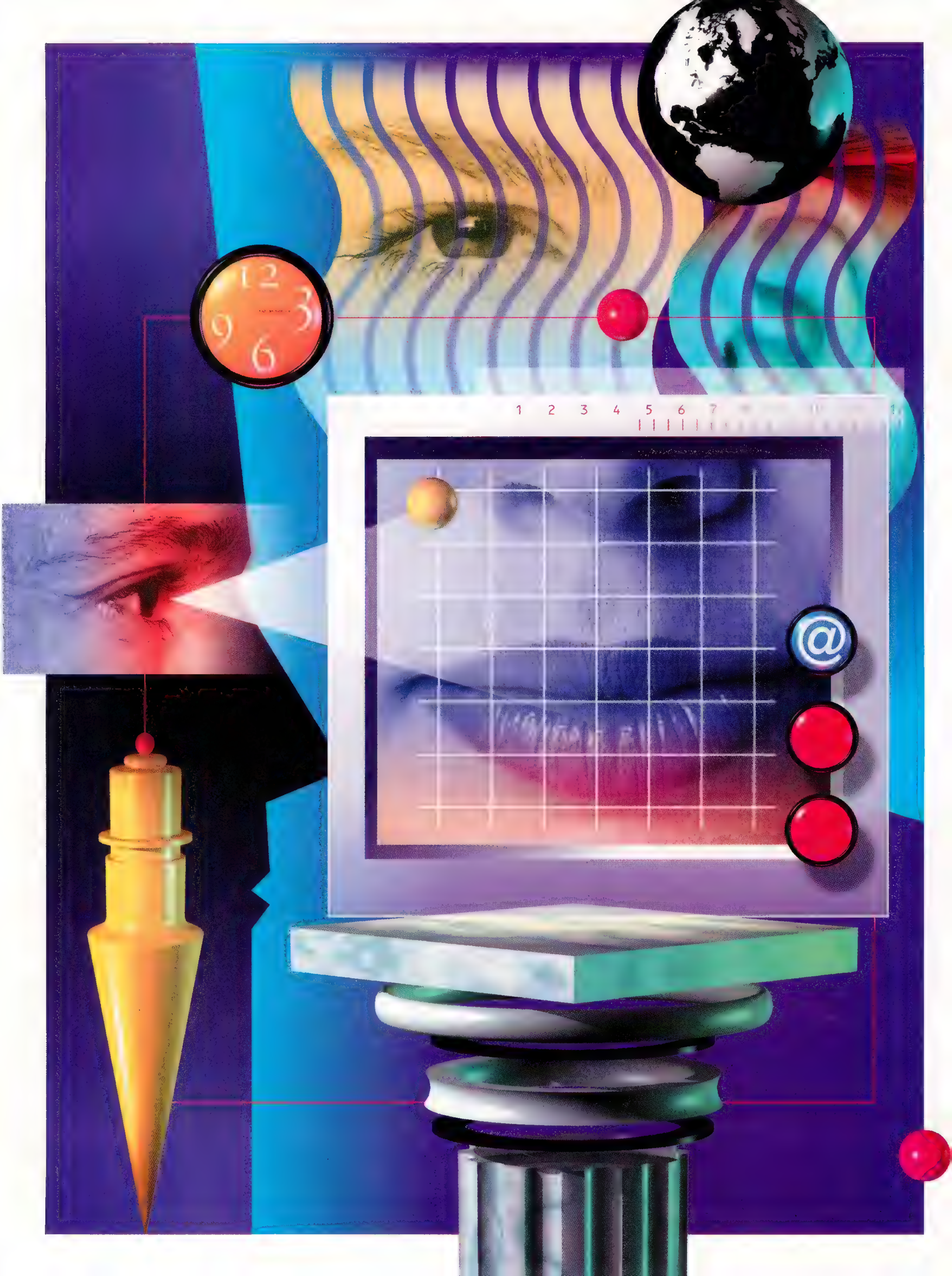
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Multimedia Comes Of Age

TECHNOLOGY AND STANDARDS GEL

BY GARY WELZ

When Al Gore first used the term "information superhighway," he wasn't talking about the Internet—he was talking about a future network in which words, sound, and video all streamed seamlessly into everyone's home, with instantaneous access to last week's *Babylon 5* episode.

This might be the year it comes to pass, thanks to better software, faster connections, and other new technologies. If you believe the people who are working to create this brave new world, viewing multimedia over the Internet in 1997 is going to be a lot like watching television or playing a video game. Audio, video, and data will flow smoothly and continuously to your PC or set-top Internet "appliance." You may even navigate around the Net as an avatar—moving easily between 2-D and 3-D environments, talking to other users, buying a computer here, and selling stock there.

This will be the year in which the software required to view multimedia is built into browsers which are, in turn, integrated into computer desktops and Internet devices like the Java Station, Oracle Network Computer, Microsoft NetPC, WebTV, game platforms, and other Internet appliances.

Just as the Internet itself was more a byproduct of an agreement to use

ILLUSTRATION BY ROY WIEMANN

The proliferation of proprietary formats is a growing problem. Two different standards may be fine, but not 30.

TCP/IP than a particular technological breakthrough, this year's multimedia revolution will be made possible because of a general consensus that open standards are good for everyone. The key words will be interoperability, integration, and ubiquity, as software, hardware, and content providers all strive to make the various file types and other aspects of the technology invisible to users and give everyone the ability to see, hear, and interact with everything and everyone else.

To speed that content through the pipes, we will begin to see the widespread implementation of high-bandwidth technologies, including higher-speed modems, ISDN, cable adapters, and ADSL. This, in turn, will increase the demand for richer multimedia—especially as more users access the Net through ISPs and online services that charge low flat rates rather than hourly fees.

MEDIA STANDARDS

Audio is becoming an assumed component of many Web sites. Traditional audio file formats include AIFF (Mac), WAV (originally Windows and now others, too), and AU (all platforms, but lower quality). Leading the way in the newer realm of streaming audio (sound that plays immediately as it flows into the desktop) are Progressive Networks' RealAudio and Xing Technologies' StreamWorks.

It has long been possible to download short video clips for playback on the desktop. Now live and recorded video can be streamed at bandwidths as low as 28.8 Kbps (see "Instant Video," Nov. '96 *IW*). Web publishers commonly make clips available in QuickTime (originally Mac only, but now other platforms), AVI (Windows), and sometimes MPEG (all platforms, but lower quality) file formats. Some television companies like C|Net and NBC are using newer streaming formats like Vivo, Xing StreamWorks, and VDOLive, among others, on their sites.

The proliferation of proprietary formats for all these technologies is a growing problem. C|Net editor-in-chief Christopher Barr says he hears from a new streaming-video vendor each week. Two different standards may be fine, but not 30. It isn't so much a matter of quality as it is the effort required on the part of publishers and users to equip themselves with servers and viewers for each new type.

Technology analyst (and *IW* columnist) Jeff Pulver says there are about 29 Internet audio products and 19 video products currently on the market. "They won't all be here next year," he says. "Rather than stand-alone apps, Netscape and Microsoft will build them into the desktop. The companies that developed many of these new technologies aren't going to like it, but the paradigm shift has occurred and the bigger players benefit."

One of the most significant developments concerning Internet multimedia was an announcement last October by Netscape (**http://www.netscape.com**) and Progressive Networks that they and 40 other companies had agreed to a proposed standard communications protocol governing delivery of real-time multimedia information over the Internet. Called the Real Time Streaming Protocol (RTSP), the new standard evolved from work done at Progressive Networks and Netscape. The agreement addresses issues like latency, reliability, quality, fidelity, and packet loss. It would standardize, among other things, the commands that start and stop an audio and video stream.

RTSP will move the Web's multimedia business forward, says Pulver. "The standard will be transparent to users, except that they will enjoy a more reliable delivery of information and an overall improvement in service. Although RTSP doesn't require that all the media types be interoperable, cross-product compatibility could be a future benefit.

Barr sees two competing standards: RTSP, which he calls "just a spec and nothing more," and Microsoft's NetShow standard (**http://www.microsoft.com**)—also "nothing more than a specification." Like many other producers and publishers, Barr is waiting for a winner.

Jim Durkin, Microsoft product unit manager for networked multimedia, doesn't see it as an either/or proposition. Microsoft thinks RTSP has value and that if the Internet Engineering Task Force approves it, Microsoft will build support for it into its products. But Durkin thinks RTSP only goes so far—dealing with a common way to say "stop" and "start" but leaving untouched the question of the

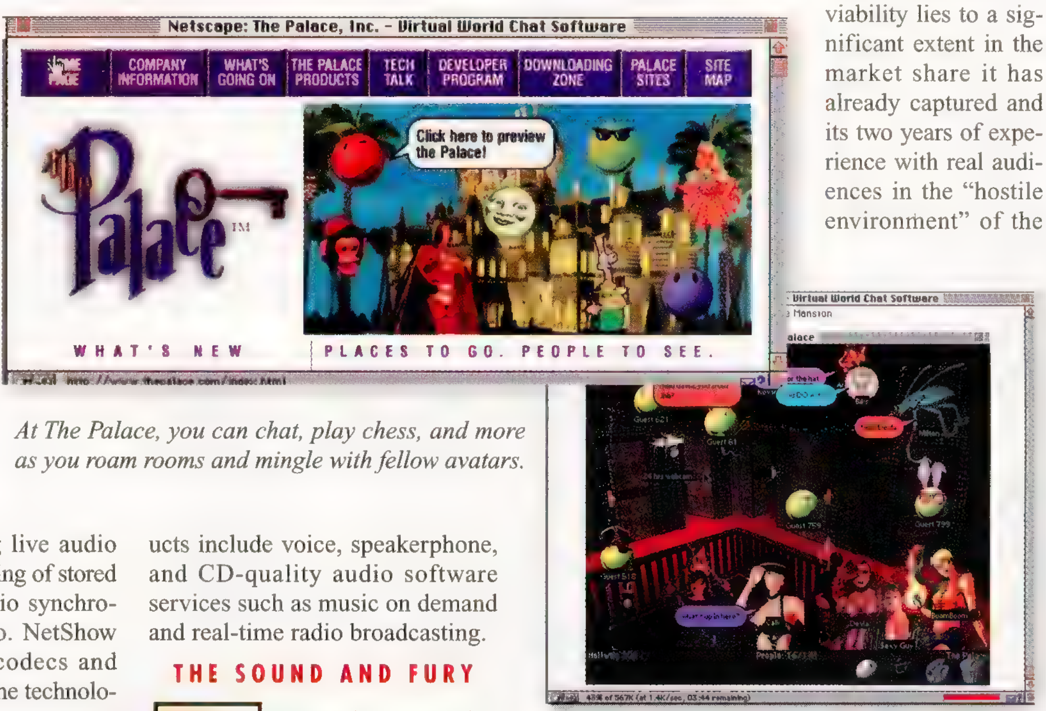
THE MOVERS AND SHAKERS

Black Sun Interactive **http://www.blacksun.com**
EarthWeb **http://www.earthweb.com**
Intel **http://www.intel.com**
Lucent Technologies **http://www.lucent.com/elemedia**
Macromedia **http://www.macromedia.com**
Marimba **http://www.marimba.com**
Narrative Communications **http://www.narrative.com**
Netcast **http://www.ncc.net**
OnlineTV **http://www.onlinetv.com**
OliVR **http://www.olivr.com**
Planet 9 Studios **http://www.planet9.com**
QuickTime Virtual Reality **http://qtvr.quicktime.apple.com**
Razorfish **http://www.razorfish.com**
RealAudio **http://www.realaudio.com**
VDOLive **http://www.vdo.net**
Vivo **http://www.vivo.com**
Vosaic **http://www.vosaic.com**
Voxware **http://www.voxware.com**
WebEarth **http://hum.amu.edu.pl/%7Ezbzw/glob/Webe.htm**
White Pine **http://www.wpine.com**
Worlds Inc. **http://www.worlds.net**
Xing StreamWorks **http://www.xingtech.com**

codec (the device that compresses and decompresses audio and video, of which there are numerous proprietary systems).

CAST OF CHARACTERS

In the end, the protocol that becomes the standard will depend on the users and the browser they choose to access the Web—mainly Netscape Navigator vs. Microsoft Internet Explorer. Not surprisingly, both companies are racing to design the products—and ink the deals—that will make their browser support the right file formats and hottest multimedia applications.



At The Palace, you can chat, play chess, and more as you roam rooms and mingle with fellow avatars.

There are a number of vendors across the marketplace building soup-to-nuts streaming media solutions, but Durkin doesn't believe there is a business in these packages. Many vendors, he feels, will do better selling the tools or codecs that make them distinct—as VDO has done by licensing its codec to Microsoft—rather than whole packages.

Microsoft is actively building diverse multimedia capabilities into its product line. NetShow is a software platform for network multimedia applications, including live audio multicasting, on-demand streaming of stored audio, "illustrated" audio (audio synchronized with images), and video. NetShow allows third parties to add codecs and authoring tools, or to integrate the technology with their own products.

Microsoft has purchased an equity stake in VDOnet (a provider of videoconferencing and video broadcasting systems) and is incorporating its VDOLive codec into NetShow. In addition, Microsoft is embedding a streaming video player in Internet Explorer from Vosaic.

To add 3-D viewing capability to Explorer, as well as viewing and creation capability to Windows 95 and Windows NT, Microsoft licensed Dimension X's Java-based VRML 2.0 Liquid Reality technology (**http://dimensionx.com**).

Microsoft's ActiveMovie is a cross-platform API (application programming interface) for developing multimedia applications, including high-quality digital video, high-fidelity audio, and special effects.

Netscape has been building up its multimedia arsenal as well. It recently introduced Media Server 1.0, which supports the RTSP standard and is geared towards high-quality streaming audio publishing. It supports multiple codecs and allows developers to create audio network applications. The server lets content creators integrate and synchronize text, graphics, and audio within HTML documents, Java applets, and JavaScript applications.

Netscape has partnered with Lucent Technologies' Elemedia division to incorporate Elemedia multimedia communications technology into future generations of Netscape's products, including Communicator and Media Server. Elemedia products include voice, speakerphone, and CD-quality audio software services such as music on demand and real-time radio broadcasting.

THE SOUND AND FURY

Progressive Networks' RealAudio player has been downloaded by more than 10 million users. RealAudio is now in version 3.0, which enables the "netcasting" of FM-stereo-quality audio. RealAudio servers are used by a great number of commercial radio services ranging from ABC and National Public Radio to college stations and homegrown Internet audio services with no over-the-air distribution. All six major record labels use RealAudio, as do many of the independents. More than 7,500 hours per week of live programs are produced using RealAudio systems.

RealAudio is hot, and Progressive Networks wants to be an even bigger player in Internet media technology. The company plans to expand the capabilities of its servers to stream any type of data. To this end, it recently announced the RealMedia Architecture (RMA), a next-generation platform for streaming audio and video applications on the Internet.

Battling Progressive Networks is Xing Technologies, which offers StreamWorks streaming audio and streaming video systems using the MPEG compression standard and boasting over 4 million players distributed. Xing CEO Howard Gordon says StreamWorks' viability lies to a significant extent in the market share it has already captured and its two years of experience with real audiences in the "hostile environment" of the Internet, where "integration into the Net is a bigger issue than compression." Xing has identified a potential $2 billion U.S. market for Internet and enterprise audio-visual networks, including 83,000 schools, 11,000 radio stations, and 3,300 TV stations.

Another player is Narrative Communications, which has a multimedia solution that includes its Enliven Viewer, Enliven Producer, and Enliven Server for streaming animation, graphics, and sound. It claims its products offer superior performance to other vendors' systems.

Other noteworthy streaming media products include Vivo Software's VivoActive, which is becoming a popular method for serving short video clips, and Enhanced CU-SeeMe from White Pine Software, which is a popular Internet videoconferencing system. Intel's Streaming Media Viewer technology is another of the growing number of streaming media solutions coming to market.

Another type of Web business model combines streaming technology with content. Netcast incorporates a proprietary streaming audio player in a browser and uses it to provide advertising-supported content. Its service offers a number of "channels" of music and talk that are accompanied by Web pages that stream into the browser along with audio and, perhaps eventually, video.

OnlineTV is a video-content service that uses a Java-based streaming-video server to enable users to view video with any Java-enabled browser.

BACKFIELD IN MOTION

In the next year, Sun Microsystem's Java programming language (**http://www.sun.com**) promises to have the greatest impact on the Internet multimedia arena. Java doesn't depend on higher bandwidth and can be used to create a tremendous variety of interactive objects, including databases and all media types.

Java also solves the "versioning" problem by making it possible for client software to be automatically distributed over the Web. This will be especially true for network computers and other Internet appliances that lack hard and floppy drives and must get all their applications from servers.

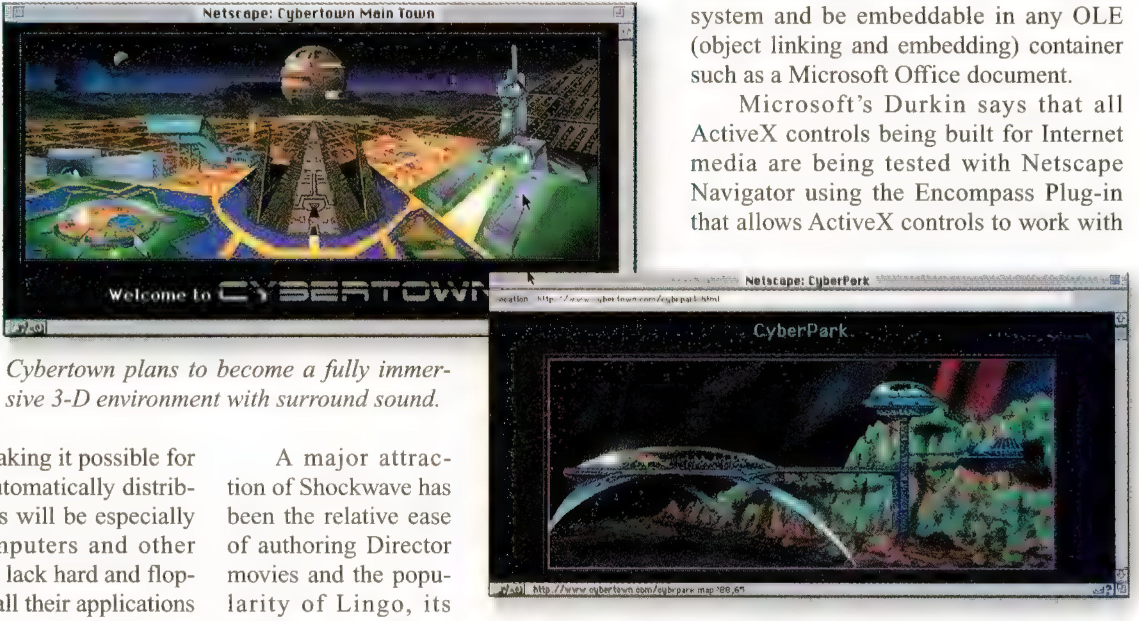
Jack Hidary, president and co-founder of the Internet software development firm EarthWeb, says its Java-based chat software will update itself on users' desktops when they go to the chat-interface page. All users see is the chat window; the latest client is distributed on the fly.

Rich Zahrabnik, executive producer of CNNfn Interactive (**http://cnnfn.com**), uses Java to create a picture-in-picture effect through an applet that launches a secondary browser window with streaming headlines and market indexes. Users can follow markets and breaking news in the side window while they surf—going back and forth as the streaming info catches their interest.

A Java competitor is Macromedia's Shockwave, which lets you put movies created with the company's Director software on the Web. Shockwave has become increasingly popular, especially since Macromedia made it possible to stream audio through Shockwave objects. Macromedia has released a small set of free Java tools (see "Live Pages," p. 72) and probably will field a more full-fledged Java offering.

Zahrabnik says he uses Shockwave for "a lot of fun stuff" on his site. "It's a way to add a multimedia component to the page that's pseudostreamed and doesn't have the problems associated with animated GIFs—that is, their tendency to mess with the client when there's a lot going on," he explained.

Hidary believes Shockwave may go out of fashion because it lacks the full functionality of a programming language. "It's good visually and its main use will be on the public Internet rather than on intranets," he said.



Cybertown plans to become a fully immersive 3-D environment with surround sound.

A major attraction of Shockwave has been the relative ease of authoring Director movies and the popularity of Lingo, its authoring language. Although Java authoring tools are getting simpler and more popular, there are thousands of developers with years of experience authoring in Macromedia's Lingo, and they won't easily give it up.

GIF animations are among the most popular and ubiquitous types of multimedia on the Web, and there are a number of animation tools and players. Although Shockwave and Java are being used for online animation, the simplicity of the GIF 89a format makes it likely that it will survive several generations of more sophisticated techniques.

Another Java competitor for developing interactive objects is Microsoft's ActiveX, which is a set of technologies based on Visual Basic that enable developers to embed customizable ready-made features called controls in Web sites (see "Activating ActiveX," Jan. *IW*).

ActiveX applications are scattered on the Web, including the CarPoint site (**http://www.carpoint.com**), where a Surround Video control created by Black Diamond lets visitors see a 360-degree view of the cars featured. You can, for example, climb into a Mercedes and check out the interior.

While there is competition between Java and ActiveX, Microsoft and Netscape are integrating both technologies into their browsers. Vendors like Asymmetrics also are building developer toolkits that accommodate both technologies. Java is even being used to write ActiveX components.

ActiveX controls written in Java will work on multiple platforms, but in Windows environments they will have access to the full resources of the operating system and be embeddable in any OLE (object linking and embedding) container such as a Microsoft Office document.

Microsoft's Durkin says that all ActiveX controls being built for Internet media are being tested with Netscape Navigator using the Encompass Plug-in that allows ActiveX controls to work with Navigator. The goal is to make every ActiveX object work in any browser, he says.

One of Microsoft's major initiatives is DirectX, a set of APIs that allows developers of interactive content to access specialized hardware features without having to write hardware-specific code. In particular, they give ActiveX controls access to hardware acceleration, making content run faster and smoother.

In the next year, Sun's Java promises to have the greatest impact on the Internet multimedia arena.

Microsoft Active Desktop is a cross-platform vehicle for ActiveX controls and Java applets. The controls and applets will be able to move about the screen as part of a rich interactive multimedia interface. Microsoft sees the Active Desktop as a "playback window" for Net multimedia.

The company has been solving user-interface challenges in the game environment for a few years and is beginning to use that knowledge on PCs and the Internet. This may produce a desktop with similarities to a game interface—perhaps representing the user as an avatar in a 3-D environment in which planes fly across the screen and are heard in surround sound.

OTHER WORLDS

Virtual worlds created using the Virtual Reality Modeling Language (VRML) are now used on the Net in a number of entertainment and business applications ranging from architecture and real estate to the sale of tickets at baseball games.

Among the most interesting are the virtual cities created by Planet 9 Studios, which include Boston, San Francisco, and New York. David Colleen, founder of Planet 9, says that during this year we'll see more Java-based objects with the ability to interact with VRML. "We're moving toward a situation in which different media types talk to each other and in which VRML worlds are enhanced with audio and video," he says.

Online multiuser virtual environments are becoming increasingly popular. Cybertown (**http://www.cybertown.com**), with its VRML Conference Room and Campus Crash Cafe, is one of the most interesting. PointWorld (**http://www.blacksun.com/pointworld.html**) from Black Sun Interactive and Point.Com is populated with unique avatars from a variety of international developers.

Worlds Inc., maker the Worlds Chat and AlphaWorld virtual environments, has created two sets of tools and servers: Gamma for Netscape/Java developers and Active Worlds for Microsoft/ActiveX developers. Worlds' products now incorporate Voxware's two-way streaming voice software and make it possible to stream audio into a world to provide ambient music or a live radio station.

Metro Goldwyn Mayer has partnered with Worlds to create a large-scale multi-user game based on the television series *The Outer Limits* that will be playable by thousands of simultaneous users.

Christopher Dean, Worlds' vice president of marketing, envisions a "Web of Worlds" where every Web site will have a 3-D world as a component. This would be a place for the members of that site's community to see and interact with one another. There are a dozen such worlds now and more are being created every day. The Active Worlds browser is an ActiveX Container Application, which means that a URL embedded in a world can be clicked on to launch Internet Explorer. The Web browser will pop up in the 3-D world allowing a collection of avatars to surf the Web together. The browser also will become an ActiveX control so it can be launched within Explorer.

IBM, Apple, Black Sun Interactive, and other companies have recently banded together to propose the Living Worlds Initiative to help standardize features of multiuser VRML communities. They intend to allow, for example, avatars from one vendor to operate on the clients and servers of others.

Another prominent multiuser application is The Palace (**http://www.thepalace.com**), a 2-D environment that enables users to enter social spaces on the Web and interact as avatars. Users can even grab components to customize their avatars. A number of Web sites (many linked on the Palace site) have built their own Palace environments.

Apple offers QuickTime Virtual Reality, which makes it possible to view objects and locations in 3-D on the desktop simply by accessing a small file and playing it like a QuickTime movie.

VIEWS OF THE FUTURE

Kevin Dallas, Microsoft product manager for DirectX, says Microsoft has focused its multimedia development efforts on the gaming, professional media, CD-ROM, and communications markets. The challenge, he says, is to "provide the multimedia foundations to mobilize content to the Internet and address performance issues."

Microsoft's interest in Internet gaming is one element of a larger industry shift toward a view of the multiplayer game as the model of computer-human interaction and online activity in the future.

Netscape sees an integrated multimedia desktop that is independent of any operating system. Its new Communicator suite includes Netscape Navigator 4.0, an HTML-editing client, a collaboration tool for group HTML discussions that can include video and other multimedia, a dynamic e-mail client that can run Java applets as well as video, and an Internet telephony and whiteboard component.

Another major component of Communicator is Constellation, which will allow users to log on or off computers throughout a network—including the Internet—and see a computer desktop with a user's personal setup.

Contrary to speculation that it would one day compete with Microsoft in the operating-systems market, Netscape says it is focusing on the ability to work across some 17 different operating systems. "Constellation is not an operating system, but is a new user interface," says Netscape marketing vice president Mike Homer.

The Castanet Tuner from Marimba will be integrated into Constellation, allowing users to subscribe to a wide range of application channels and self-updating content such as spreadsheets or real-time newsfeeds.

Netscape also has spun off Navio (**http://www.navio.com**) to create Navigator software for consumer products like telephones, Web TVs, gaming platforms, and other non-PC devices.

Integrating the Web with games and other types of communication could be a major part of Netscape's business in the years ahead. At the moment, however, the company is concentrating on intranets and enterprise computing, believing that, in the short term, the greatest market for collaborative media and multimedia will be business users. ■

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The ORIGIN of PCs

From Babbage's Difference Engine through Windows 95, the history of the personal computer is online.

BY **DAVID NOACK**

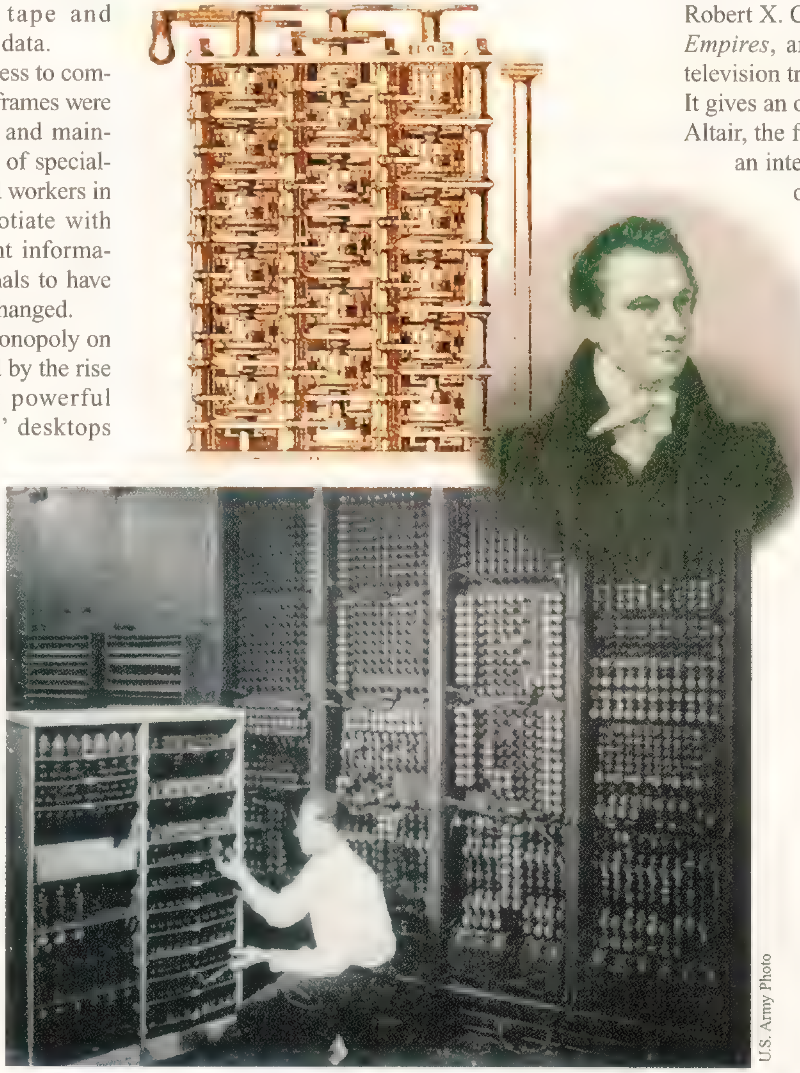
IN THE EARLY 1970S, THERE WAS NO SUCH device as a personal computer. The most common type of computers were expensive mainframes housed in glass-enclosed, cooled rooms ("glass houses") and used mostly by large organizations and corporations. These room-sized computers typically relied on large spools of magnetic tape and punch cards to process data.

Few people had access to computers at this time. Mainframes were programmed, operated, and maintained by an elite group of specialists. All departments and workers in a company had to negotiate with these MIS (management information systems) professionals to have applications written or changed.

This glass-house monopoly on computers was shattered by the rise of the PC, which put powerful computers on workers' desktops and ended their dependence on MIS specialists. The introduction of VisiCalc on the Apple II in 1979 meant that accountants could compute their own numbers, and not wait hours—or longer—while the acolytes of the mainframe ran the program for them. Low-cost PCs also made it possible for people to have computers in their homes. And the PC revolution in the '80s laid the foundation for the Internet revolution of the '90s.

Perhaps more than any other industry, the development of the personal computer business is a fascinating tale of companies and technologies that flourished and foundered. Some people made millions, or billions, while others went bankrupt and disappeared.

A vast amount of material is now online that documents this 20-odd-year era of digital history. You can follow the PC industry's peaks and valleys, personalities and products, successes and failures. There is a library of information on home-brewed personal computers and those produced on assembly lines, as well as sites devoted to user groups that still support 8-bit machines and historical societies that are trying to preserve computing history.


U.S. Army Photo

ONCE UPON A TIME

Charles Babbage's Difference Engine (top) is considered the grandfather of modern computers, including ENIAC (bottom).

WITH SO MANY COMPUTER-OBSESSED people on the Internet, many of whom were part of the PC revolution, the Net is proving the ideal medium for documenting the history of the PC. Some sites are devoted to the complete history of PCs, some to specific companies, and some are shrines to particular computers. PC history also is found in sites that cover computer history in general.

A good place to begin the virtual PC journey is the Triumph of the Nerds page (**http://www.pbs.org/nerds**), based on the public television program that chronicled the history of the personal computer. The program was based on *InfoWorld* columnist Robert X. Cringley's 1991 book *Accidental Empires*, and the site includes the entire television transcript of the three-hour show. It gives an overview of PC history from the Altair, the first personal computer, through an interview with Larry Ellison, CEO of Oracle Development Corp., making his argument for the network computer. A computer game called "Can You Guess the Computer?" lets you "test your nerd quotient."

The Timeline of Microcomputers (**http://www.islandnet.com/~kpolsson/comphist.htm**) traces the rise of the PC computing industry and puts it in historical context, taking us back to the early part of the 20th century to highlights, events, personalities, and discoveries that played a role in shaping and prodding computers along.

From the work that went into creating the first transistor in 1947 by Bell Labs scientists, to Microsoft shipping 30 million units of Windows 95, this site guides you through decades of milestone events in the computing industry. There are also hundreds of links to other Web pages and images of a variety of computers and microprocessors.

Ken Polsson, a computer programmer and forest researcher in British Columbia, Canada, created the Timeline of Microcomputers and put it on the Web, which he said was the perfect vehicle. "There are fan pages and file directories maintained by those who refuse to let these gems die. So many people have one tucked away in the closet or attic that it doesn't take much for some of them to scan in a few photos and provide some info about what they know."

"SO MUCH IS THROWN OUT THAT EVEN RELICS FROM **20 YEARS AGO** ARE MORE VALUABLE THAN CARS FROM 80 YEARS AGO."

Polsson is concerned that some computing history may be disappearing forever. "Manuals are discarded, diskettes lose their magnetic recordings, tape readers and disk drivers are lost. The development of computer technology has proceeded more rapidly than anything previously invented. So much is thrown out that even relics from 20 years ago are more scarce and more valuable than cars from 80 years ago," said Polsson.

One group preserving this past is the Computer History Association of California (CHAC, at **http://www.chac.org/chac**), which was created in 1993 to "study, preserve, protect, and popularize the history of electronic computing in the State of California." The site offers a rich mix of resources, including the group's quarterly publication, "Analytical Engine."

CHAC's History Pages provide detailed information about personal computer hardware, software, computer museums, and even computer folklore. There are excellent papers on operating systems such as CP/M (Gary Kildall's OS for the Altair, which was a victim of the rise of Microsoft's DOS), a history of the graphical user interface from Xerox PARC's Alto, and a link to Amdahl Corps.'s 25th Anniversary Web site celebrating Unix. There also are stories and first-person accounts from people who have worked on or with mainframes.

The University of California at Davis Computer Science Museum (**http://wwwcsif.cs.ucdavis.edu/~csclub/museum/homepage.html**) is doing its part to preserve a bit of personal computing history. The virtual museum exhibits include the Kaypro 2 Portable, the Data General 1, Imsai 8080, and several other makes and models. You'll find images of the computers and some brief technical details. The site also includes a timeline of computer history.

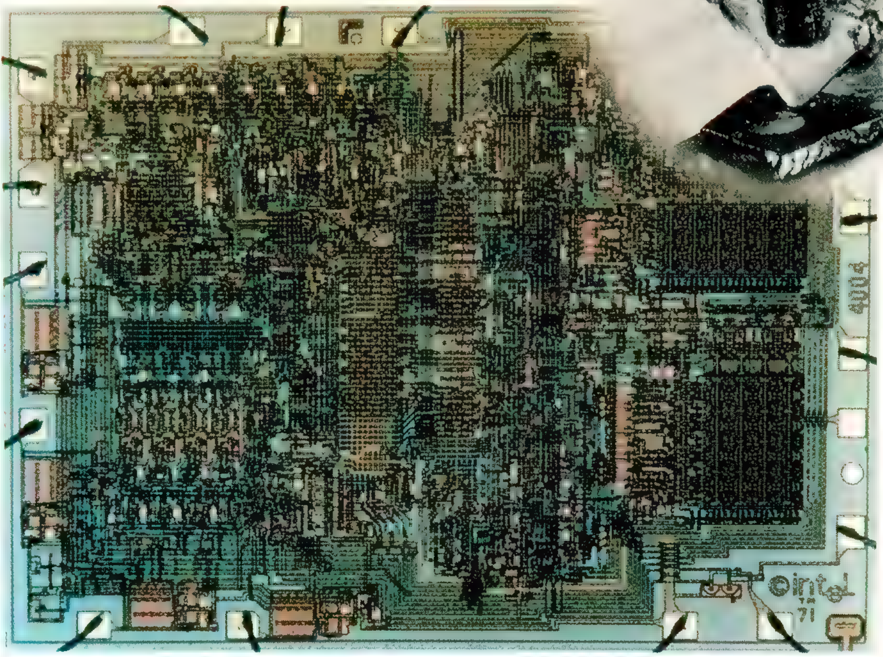
The Virtual Computer History Museum (**http://video.cs.vt.edu:90/history**) showcases a wealth of information about the history and development of the personal computer. When you reach the museum's lobby page, you are given several choices about how you would like to browse through the material. Using a series of radio buttons, you can take a chronological look at the past in a text-based format or view it graphically.

Said Dr. John A.N. Lee, a professor of computer science at Virginia Tech and editor-in-chief of the *IEEE Annals of the History of Computing*, "Preserving the history on the Web provides search engines that would not otherwise be available through traditional libraries. My hope is that having a Web page will raise the awareness factor of the history of computing in the Internet community."

The Virtual Museum of Computing (**http://www.comlab.ox.ac.uk/archive/other/**

MAKING IT POSSIBLE

Building on one another were the transistor (right, 1947), integrated circuit (below right, 1958), and microprocessor (below, Intel's original 4004, 1969).



Courtesy of Intel Corp

Courtesy of Microsoft Corp.

Brian Tramontana/Xerox Palo Alto Research Center

A VERY GOOD PLACE TO START

Bill Gates and Paul Allen (top) built BASIC for the Altair 8800 (left)...and started an empire. But today's graphical interface began at Xerox PARC, with the Alto (below), which featured WYSIWYG type, built-in networking and pull-down menus—in 1972.

museums/computing.html) is a comprehensive source of computer history, with links to corporate history and overviews, computer-related museums, and a variety of online exhibits and information. Recent additions to the site include links to Web pages celebrating the 50th anniversary of ENIAC (Electronic Numerical Integrator and Computer), which heralded the birth of modern computing. Plans are being made to celebrate the 50th anniversary of the Manchester Mark I, the world's first stored-program digital computer that successfully executed its first program on June 21, 1948.

For more on ENIAC, an excellent collection can be found at the History of Computing Information site (**http://ftp.arl.mil/~mike/comphist**), produced by the U.S. Army to celebrate ENIAC's 50th anniversary. The site offers an eclectic mix of documents and photographs chronicling the life and times of ENIAC, plus a host of links to other computing sites.

THOSE ORGANIZATIONS DO AN EXCELLENT job of chronicling the rise of the personal computer, but for a more personal look at the history of the PC, turn to the pages put up by individuals. They comprise a subculture of serious computer enthusiasts who refurbish computers as a hobby or for a living. Their collections reflect their personal interests, and they're all on the lookout for new items.

Among the best is the Obsolete Computer Museum (**http://www.ncsc.dni.us/fun/user/tcc/cmuseum/cmuseum.htm**), which offers a packaged tour of bygone personal computers. Its exhibits include the Amstrad CPC-64, 512K Apple Macintosh, Commodore 64, Osborne Vixen, Tandy TRS-80 Model I, and Sinclair ZX80. Go to the listing for Commodore computers, for example, and click on C64; you'll find a color photograph of the machine, a brief description, and links to some other C64 photographs and a C64 home page.

Other noteworthy collections include Carl Friend's Minicomputer Museum (**http://www.ultranet.com/~engelbrt/carl/museum**), Paul Pierce's Computer Collection (**http://www.teleport.com/~prp/collect**), and Kevan's Computer Bits (**http://www.ftech.net/~kevan/collection**). Friend's is a finely produced page featuring vintage Data General Corp. and Digital Equipment Corp. machines. Highlights of Pierce's collection include precomputer electronic calculators and his menagerie of IBM mainframes. Kevan Heydon provides a well-presented alphabetized collection of about 80 machines, from Acorn to Toshiba models. Each of these sites offers a good set of links to other online computer museums and fellow enthusiasts' pages.

There are several online computer history sites devoted to Apple Computer and its machines. The Apple Corporate Timeline (**http://product.info.apple.com/pr/background/1995/pr.background.timeline.html**) documents Apple's history and development from 1976 to the present. Key moments in the company's history—from product introductions to important personnel changes—are described.

The History of Apple Computer (**http://www.apple-history.pair.com/history.html**) provides an overview of Apple at different stages in the company's development, from the days of Steven Jobs and Steven Wozniak to the legendary battle between Jobs and John Sculley to Michael Spindler's stewardship and what the future may hold for Apple's new leader, Gilbert Amelio. There is also information and photographs of Apple computers from the Lisa to the Powerbook 165 to the Performa 6400.

Courtesy Apple Computer, Inc.

BRINGING IT HOME

Jobs and Wozniak's Apple (left, under Jobs), the Commodore PET and 64 (right), and the Tandy TRS-80 marked the beginning of desktop business—and home—computing.

Speaking of the ill-fated Lisa, The Apple Lisa Web Page (**http://www.artsci.wustl.edu/~ssteplet/lisa.html**) is an excellent resource on the computer that led to the Macintosh. The page is built in a FAQ format, and includes links to technical and service information for the Lisa.

Apple II buffs will find plenty of material in the Apple II History home page (**http://www.hypermall.com/History**). This 23-part series takes you from the pre-Apple history to all the different variations and permutations of the Apple II to peripherals, computer languages, software, and even magazines that covered the Apple II.

On the other side of the fence is the Microsoft History Web page (**http://library.microsoft.com/msinfo/mshist.htm**), which follows the company's history from 1975 to 1995. Click on a date and a text document of events that occurred during that year will appear.

A treasure trove for Commodore users and fans is Jim Brain's US Commodore 8-Bit Computer WWW Site (**http://www.msen.com/~brain/cbmhome.html**), which provides a FAQ list, Commodore trivia game, and links to other Commodore sites, including one to a CBM (Commodore Business Machines) Document Page. Because it's hard to find this documentation in print anymore, this is a godsend. There also is the Canonical List of Commodore Produced Computer Equipment. If Commodore made it, you'll find it listed here.

HISTORY AND HISTORY IN THE

8bit Emulation FAQ
http://www.cis.ohio-state.edu/hypertext/faq/usenet/8bit-emulation-faq/top.html

Apple II Page
http://www.stolaf.edu/people/handel/

Atari 8-Bit FAQ
http://www.cis.ohio-state.edu/hypertext/faq/usenet/atari-8-bit/top.html

Charles Babbage Institute
http://www.itdean.umn.edu/cbi/welcome.htm

Commodore 8-bit Web Server
http://www.hut.fi/~msmakela/cbm/

Commodore FAQ
http://www.cis.ohio-state.edu/hypertext/faq/usenet/commodore/binaries-faq/part1/faq.html

Computer Collection
http://www.msn.fullfeed.com/~cube/

Computer History Web Sites
http://granite.sentex.net/~ccmuseum/hist_sites.html

Computer History and Emulation Homepage
http://www.freeflight.com/fms/comp/

Computer Museum
http://www.net.org

Great CPUs of the Past and Present
http://www.cs.uregina.ca/~bayk/cpu.html

Historical Computer Society
http://www.cyberstreet.com/hcs/hcs.htm

History of Computing (Los Alamos)
http://bang.lanl.gov/video/sunedu/computer/comphist.html

History of Computers
http://chuck.acc-lab.american.edu/~ah0319a/rude/comphist.htm

History of Technology and Computers
http://www.tectrix.com/links/tech_hist.html

Hobbes's Internet Timeline
http://info.isoc.org/guest/zakon/Internet/History/HIT.html

Jim's Computer Garage
http://www.rdrop.com/users/jimw/jcgm.html

> HOBBES'S INTERNET TIMELINE TRACES THE DEVELOPMENT OF THE **INTERNET** FROM THE ERA OF THE SPACE RACE.

A site devoted to women's contributions to computing is the Past Notable Women of Computing & Mathematics (**http://www.cs.yale.edu/homes/tap/past-women.html**). It includes information on such notables as Edith Clarke, who filed a patent in 1921 for a "graphical calculator," and Adele Goldstine, who authored the Manual for the ENIAC in 1946.

THERE ARE A NUMBER OF SITES DEVOTED TO the history and evolution of the Internet. Start with Hobbes's Internet Timeline (**http://info.isoc.org/guest/zakon/Internet/History/HIT.html**), which traces the development of the Internet from the era of the space race between the United States and Soviet Union. There are numerous links scattered throughout the text document that link to key sites and events.

History of the Internet and WWW: View From Internet Valley (**http://www.Internetvalley.com/intval.html**) takes you on a virtual walk through the history of how the Internet and World Wide Web developed. The site provides a timeline of events and links to a variety of documents and images that explain the progression of the Internet's development.

NetHistory (**http://www.geocities.com/SiliconValley/2260**) bills itself as offering an "informal history of BITNET and the Internet." There are three main areas in the archives where you'll find a collection of early VM/COM, which was BITnet's first electronic magazine, as well as back issues of *NetMonth*, *NetWeek*, and *The Gliding Byte*.

Like any history lesson, the story of the personal computer is filled with winners and losers. But, for the first time, both sides are able to tell their story. Thanks to the Internet, history is written by both the victors and the defeated.

As the PC revolution continues, the Net is bristling with its history, updated almost daily. So fire up your Pentium PC or PowerMac and take it for a tour. ■

David Noack (dnoack@mhv.net) is a freelance writer based in New York.

Mac OS
Mac OS
Mac OS

THE MODERN AGE

The Apple Lisa (left) and IBM Personal Computer (right) marked the beginning of the era of the desktop PC—the former for its interface, the latter for its ubiquity.

MAKING

Little History of
the World Wide Web
http://www.w3.org/pub/WWW/istory.html

Retrocomputing Museum
http://www.ccil.org/retro/retromuseum.html

TRS-80 Color Computer
http://www.sfn.saskatoon.sk.ca/~ab594/coco.html

University of Virginia—
Computer Science Museum
http://www.cs.virginia.edu/brochure/museum.html

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"The U.S. Robotics Sportster ISDN 128K stood out for its performance, ease of use, all-around flexibility, and reasonable price... it blew away the competition in our remote access tests, making it an ideal choice for telecommuters. The Sportster was a dream to install—you simply plug it in and go." PC World, August '96

"The Sportster ISDN 128K might have been named the Screamer. It was the only product in our test group to provide data compression, and this ISA-bus ISDN adapter, from U.S. Robotics, blew the other five products away on our performance tests." PC Magazine, June '96

"A top performer in our testing, the inexpensive, feature-rich Sportster 128K has 'buy me' written all over it... At only $399, this internal adapter rockets you from place to place on the Internet at speeds of over 113 Kbps with none of the limitations imposed by a serial port." CNET, July '96

Let's just say light is starting to get jealous.

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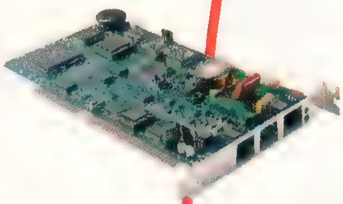

"The Screamer"
- PC Magazine

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CIRCLE NUMBER 62

RSA DATA'S JIM BIDZOS   BY JEFF UBOIS

CRYPTIC MINISTER

RSA Data Security (Redwood City, Calif.) is a leading vendor of encryption technology(**http://www. ras.com**). It has licensed millions of copies of its products and has taken ownership stakes in companies such as CyberCash (3 percent) and Netscape (1 percent). Following a merger last year with Security Dynamics, the 50-person company was valued at more than $300 million. Because many emerging secure transaction systems are based on its technology, RSA stands to benefit from the expansion of secure Internet commerce.

RSA's encryption technology lets users sign and seal documents in a digital environment, just as businesses use signatures and envelopes to ensure messages are genuine and remain private while in transit. That may sound innocuous, but RSA's software is powerful enough to be classified as a munition and is regarded as a serious threat by governments of the United States, Japan, and Europe because it provides communications security that is nearly impossible

PHOTOGRAPHED BY WILLIAM MERCER McLEOD

Jim Bidzos: "The world is a much better place with cryptography."

for law enforcement and intelligence agencies to crack. It also has the potential to support untraceable, untaxable cash transfers.

RSA CEO D. James Bidzos argues that encryption provides the security needed for electronic commerce while restoring some measure of privacy in what is rapidly becoming a surveillance society.

CRYPTIC MINISTER

PEOPLE FIND THIS TECHNOLOGY INCREDIBLY TIMELY, POWERFUL, AND USEFUL, BUT THE GOVERNMENT FINDS IT THREATENING.

INTERNET WORLD: *What are some of the products that use RSA, and how many copies are now in use?*

BIDZOS: There are about 90 million copies of our software in use right now, and anybody who's reading this magazine is probably using RSA in some form. Every browser and server made by Microsoft, Netscape, Oracle, IBM, Open Market, Spry, Spyglass, and so on has our software. That alone accounts for more than 50 million copies. It has emerged as a de facto standard in the Web world pretty quickly.

We've been in every copy of Lotus Notes since the beginning, in 1989. Lotus Notes is a particularly good example of how to properly implement cryptography, because 7 million Notes users send somewhere around 20 million RSA-encrypted messages a day, and they don't even know it. Security needs to be efficient, hidden, out of the user's way.

We are in so many products. I couldn't even list them all. For example, Med Plus, a company in Cincinnati, sends patient records to physicians across the Internet.

Aquila in New Mexico builds monitoring cameras for nuclear facilities and supports enforcement of nuclear non-proliferation treaties. These are digital cameras so the images have to be authenticated for obvious reasons, so our software is at work making the world a safer place.

And there are so many Internet companies, like CyberCash and WebTV, that are using our software to provide privacy and security for their customers. There are other areas like pay TV where we are really making tremendous progress. Almost every major pay TV provider is using our technology to protect themselves.

We are moving big time into Internet fax with a company called FaxSav, which lets you securely send faxes around the world over the Internet. We also just announced that Matsushita Graphic Communications and RSA will jointly develop an Internet-based fax machine with an encryption function.

I think it's pretty clear that all this stems from new uses of the Internet. In January, you're going to see probably the most significant crypto event in history.

IW: *Which is?*

BIDZOS: It will be the shipment of Netscape Navigator 4.0, in which Netscape has integrated S/MIME [Secure Multimedia Internet Mail Extensions]. The reason it will be the most significant event in crypto history is that never before have 40 million people all received the ability to have interoperable, secured e-mail with a product they already use. And Microsoft has announced that it is going to support S/MIME in both Internet Explorer and Microsoft Exchange.

One of the Big Five accounting firms has put out a bid for an e-mail system for something like 100,000 people that requires S/MIME. So the market is maturing quickly. We're seeing standards evolve.

IW: *A lot of people don't know why cryptography matters. Can you bring us up to speed on the relationship between cryptography, privacy, and authentication?*

BIDZOS: We've relied for a long time on envelopes and signatures to do business. We secure our communications by putting them in envelopes and sending them to people. We authenticate our business transactions by putting signatures on a piece of paper, and obviously you can't do either of those things with computer bits.

So what RSA offers is the envelope and a signature for the electronic information age. All of this activity, all these protocols and standards—SET, S/MIME, S/WAN, S-HTTP—all the products that I mentioned earlier are built on this simple idea of signatures and envelopes. And these complex protocols have at the heart of them this fundamental technology. That's what's really fueling the e-commerce revolution—the fact that you can now do some of this stuff securely.

IW: *Signatures and envelopes seem harmless enough, but your software is legally classed as a munition. Why does the Clinton administration and the U.S. law enforcement community act as if signatures and envelopes will end life as we know it?*

BIDZOS: This is a technology that individuals and industry find empowering and liberating because it gives us the opportunity to recover a lot of privacy that we lost when we started moving into the digital world. The Internet has probably caused more privacy loss than anything that's ever happened. You know there is a downside to the Internet. Whether you are on the Internet or not, you should be concerned about this because companies with sensitive information about you are getting on the Net and hackers are getting into their machines. You're at risk even if you're not online.

At any rate, people find this technology incredibly timely, powerful, and useful, but the government finds it threatening. And there are several aspects to the government's concern.

First, there's the international intelligence gathering part of the government that's very concerned about this technology. It has a capability that no other government in the world has to conduct electronic eavesdropping. We have the most powerful, best funded, most technically advanced intelligence agency, the NSA [National Security Agency]. Being able to listen to your enemies is a powerful advantage. Its concern is that this advantage could be wiped out and the playing field leveled by the proliferation of low-cost, or no-cost, high-grade encryption.

Law enforcement has gotten into the game and said they are concerned that criminals will be able to use the technology to conceal their activities. So the government is concerned about its ability to conduct law enforcement. So there's conflict. Industry and individuals want privacy; they can't see

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For the best Internet software for business/corporate applications.

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For the best Internet hardware for business/corporate applications.

Outstanding Consumer Hardware Product
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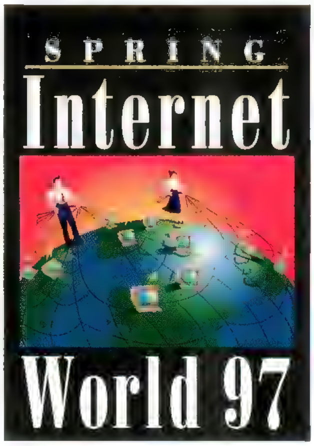

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1996 Inductees

Outstanding Software Product:
Progressive Networks, RealAudio

Outstanding Hardware Product:
MicroTouch Systems, WebStation

Outstanding Service:
Digital Equipment Corporation for Alta Vista

Excellence in Promotion of the Internet:
The American Civil Liberties Union (ACLU) for its challenge to the Communications Decency Act

Outstanding Achievement:
Sun Microsystems for Java

Best of the Internet:
Java from Sun Microsystems

1995 Inductees

Outstanding Software Product:
Navigator 1.1, Netscape Communications Corporation

Outstanding Hardware Product:
IBM SOHO Assistant, Rockwell Communications Nethopper

Outstanding Service:
Jerry Chih-Yuan and David Filo for Yahoo!

Excellence in Promotion of the Internet:
Mike Godwin, Electronic Frontier Foundation (EFF)

Individual Achievement:
Philip Zimmermann for Pretty Good Privacy (PGP)

Best of the Internet:
Yahoo!

1994 Inductees

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Marc Andreessen

Outstanding Hardware Development:
Telebit Corporation

Outstanding Service:
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Outstanding Marketing:
Digital Equipment Corporation

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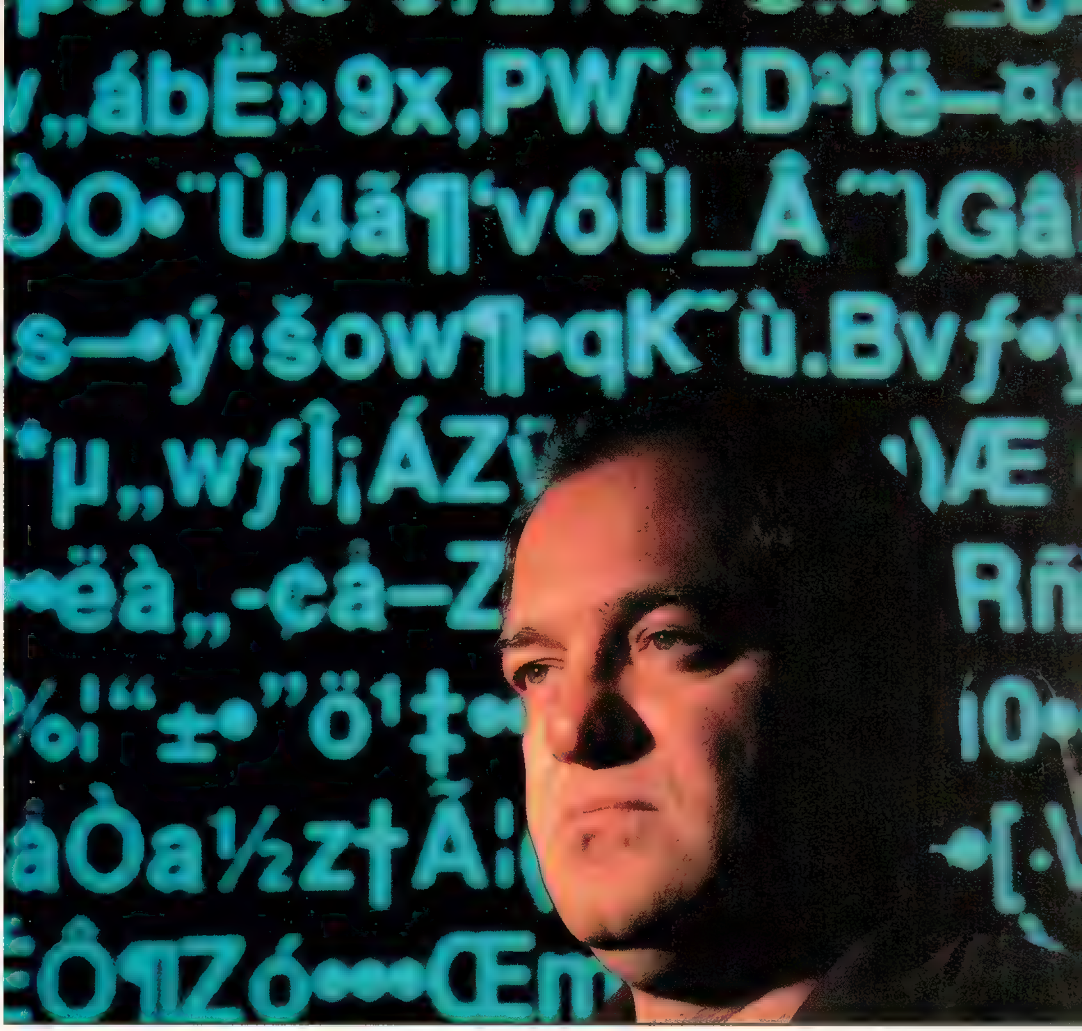
using the Internet without it. As industry and individuals get more concerned, more cryptography results from that, so the government gets more concerned.

Any new technology that benefits society as a whole benefits the criminal element of that society as well. And there is little we can do about that. However, what the government is doing is taking a very aggressive approach that has put off a lot of people. They have reacted with the Clipper chip and other policies and said, "No, no, no, we've got to control this technology."



IW: *The whole debate has pretty much been a series of either/or propositions. Is it possible to arrive at solutions that offer security and privacy as well as accountability?*

BIDZOS: There has never been a quality debate in the open about this. Assuming that there is a real compromise—and I'm not convinced there isn't, sort of like the Fourth Amendment, which talks about reasonable search and seizure—I think the government has squandered an opportunity to find it because their policies have put people off. They've come back so insistently with poorly thought out proposals like the Clipper chip, which just doesn't work.

On the concrete highways, you see that there has been some sort of compromise. If law enforcement has reason to suspect that something is going on, they can conduct a search and seizure.

Maybe we could have compromised on search and seizure on the information superhighway, but what the government has said, is if you keep an unbreakable glove-box in your car, you have to give law enforcement a copy of the key when you buy the car.

IW: *So what are the prospects for any kind of resolution?*

BIDZOS: There is nothing new about conflict between industry and government that makes for complicated economic policy, but rarely in history have we seen such sharp disagreement. What we are looking at now is a conflict between the National Security Agency and the Justice Department on one hand, and the computer hardware, software, and communications industry on the other.

These are our fastest growing industries; this is the future economic security of the United States. So I think this is heating up to be a much bigger conflict than anybody had ever thought. The stakes have gotten so huge now.

IW: *How, specifically, does the government control cryptography?*

BIDZOS: The government asserts its interest in a number of different ways. One is through export controls. It tries to stop the flow of easy-to-use, low-cost or no-cost cryptography embedded in products. Controlling the export from the United States is a good way to do it because that's where most of these products come from.

The export controls have sort of worked, but they've created a huge conflict. We see hearings in the House and Senate frequently criticizing the administration's policy. I think there were 28 congressmen who reacted to the latest government announcement saying, "No, this is not good. We need to allow industry to compete."

The government also uses its standards-making authority and purchasing power to try to influence what's happening in industry. With the standard-setting authority, they've had little or no success whatsoever. The only two standards in the United States government for public-key cryptography are for escrowed encryption, which essentially escrows keys *á la* the Clipper chip, and the digital signature standard, both of which have not gone very far.

The government's ability to influence by standard setting has diminished drastically as it becomes a smaller and smaller part of the market for computer companies. Back in the '60s the government was better than 50 percent of the computer market in the United States, and it had tremendous influence. Today, for most companies, it's about 2 percent to 5 percent, if that. I think it is pretty clear companies are going to do what the other 97 percent of the market says, and that's how a company succeeds, by listening to its customers.

And in the last area, where the government uses its economic power to try to buy these products, that has had virtually no impact on the market. So if you look at these three policies and look at what it's done—the export controls have been in place for a long, long time—the standards-making activity began in 1991 with DSS, [Digital Signature Standard, a U.S. government encryption technology] and the

> **THIS IS HEATING UP TO BE A MUCH BIGGER CONFLICT THAN ANYBODY HAD EVER THOUGHT. THE STAKES HAVE GOTTEN SO HUGE.**

government lately has been buying Fortezza cards with Clipper chips in them.

So what has the government really done? It hasn't swayed anyone in industry to use these products. In fact, industry doesn't want to use these products at all.

IW: *And what have been the real rather than intended consequences?*

BIDZOS: There are several unfortunate results of all this. First, the civilian side of government needs to behave like private companies. It needs to service its customers and to take new technology and put it to work to be more efficient—to save taxpayer dollars. Because the government does not give waivers to these standards—DSS and escrow encryption—in theory, the civilian side of government cannot use off-the-shelf products that contain RSA.

So a civilian agency that wants to modernize, streamline, and reinvent itself—to let people look at Social Security records on the Web, for example, or to interact with taxpayers on the Web—in theory, they can't use the innovative products that industry is building because the law says, "No, you must use DSS and Clipper." Well, nobody is building those products. So the civilian agencies are forced to try to convince companies to build the products—which can only be done if they spend a tremendous amount of money—or to use no security at all.

IW: *So a government worker in the Commerce Department who gets a free subscription to the* The New York Times *using Netscape and a secure password. . . .*

BIDZOS: In theory, they are in direct violation of government policy. There are a lot of people in direct violation of that policy. If the government wanted to play it by the book, it would have to fire about a third of the work force and shut down two-thirds of the government.

Many years ago I heard from people at NSA say that they needed to control encryption, they needed to control RSA because criminals would take over the world. Well, RSA has proliferated, it is everywhere, and I think the world is better off, rather than worse off, as a result. I don't think that money launderers and drug smugglers and child pornographers run the world.

Their prediction of the demise of society as a result of the spread of RSA seems to have been exaggerated. What they've done is hurt government in the way I just described. And there's another way they are hurting citizens: Because when you put all this together, the export controls and the standards, they have slowed the development of encryption, and now a lot of people are at risk.

We read about break-ins and data theft every day. That's a tip of the iceberg. What about the stuff we don't read about?

IW: *Well if you knew what they knew that they can't tell you. . . .*

BIDZOS: Let's assume they know something and we don't know it. But let's look at the other side of it. Whatever they are getting as a result of their policies, the price we are being asked to pay is growing daily.

First of all, we are putting the competitiveness of U.S. industry at risk. We are encouraging other companies to jump in. In fact, it's hard for me to exaggerate how much economic damage we are doing to ourselves every day that we won't even see.

Let me give you an example: Large telecom companies outside the U.S. are starting to wire up emerging countries. These emerging countries are not laying copper wire, they are leapfrogging; they are bypassing existing infrastructure and jumping into fiber-optic cables and wireless communications. And they are getting these from companies other than U.S. companies because they can get security in them. And so security is handing them a significant amount of business. But whoever wires a country is probably going to be selling them all the products they buy for a long, long time afterwards, maybe for 5, 10, or 20 years, because they essentially control the infrastructure.

IW: *Is there another side to that? Motorola got a deal in Pakistan because it let the Pakistani government essentially listen in on all conversations. Does limiting exports to eavesdropping and surveillance technologies mean we are going to be supporting repressive governments?*

BIDZOS: That's an interesting point. I think political scientists need to look carefully at this. We've made mistakes before. Are we essentially using our ability to control this technology and to provide it in different ways to conduct foreign policy?

We are helping that government [Pakistan] do something we would never allow the government to do in this country. In our case, we're hurting industry, we're hurting privacy, and we're doing something else. The government is, with the Clipper chip and key escrow, trying to do things that raise serious constitutional issues, serious questions about rights to privacy and the government's right to have access.

IW: *Interesting that the debate is essentially between industry and government when it is individual and constitutional rights that are at stake.*

BIDZOS: My sense is that people are speaking very loud and clear on this. They don't want the government to have those powers. It invites abuse, it's not well thought-out, it serves a small interest.

IW: *What is the dark side of this? What are we going to give up if we have anonymity and complete privacy in communications?*

BIDZOS: Let me use an analogy. What if you asked the automotive industry how it feels about making a product that will kill 40,000 people every year, year in and year out? The answer you'd get from the purchaser of the product is the same, whether it's strong encryption or an automobile. He would say that the risk is acceptable and that the alternatives are unacceptable. And if the purchaser can't get it in the United States, he'll get it somewhere else.

And what do I mean by that? Let's say the U.S. government said that in the United States, all cars that are manufactured must be limited to 5 miles an hour, because we are going to put safety first, above everything else. And by the way, the government is not going to say that any cars imported have to go 5 miles an hour, just cars made in the United States. And if

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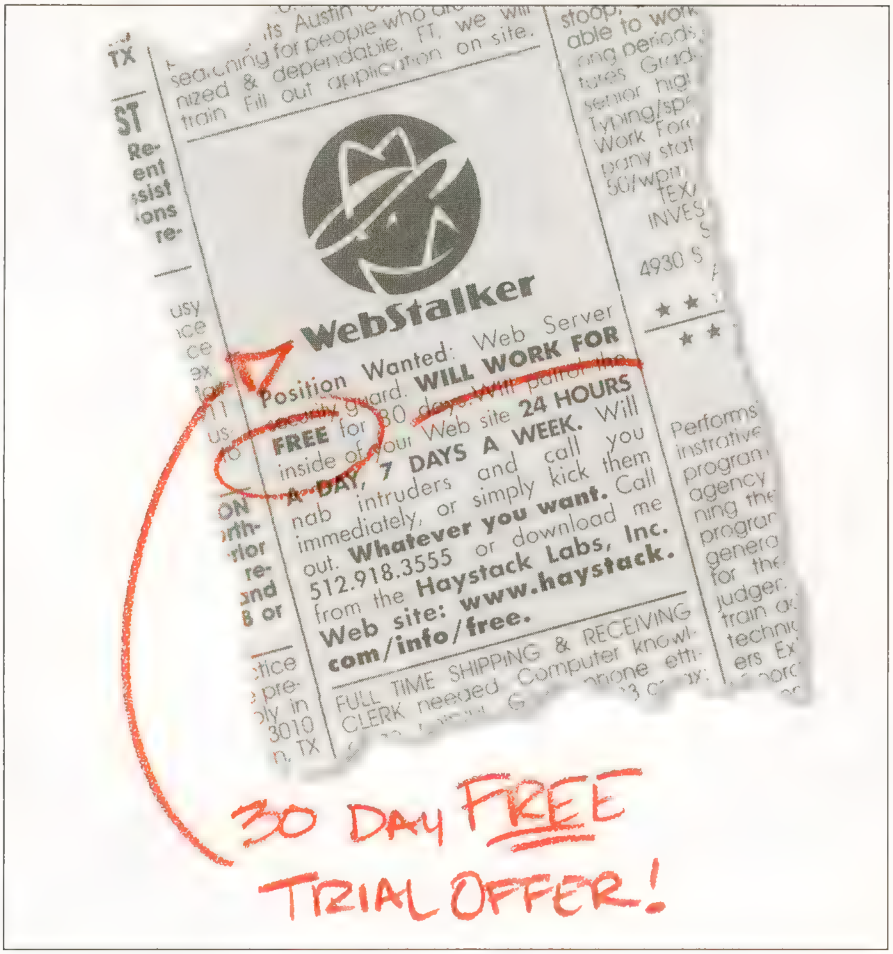

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CIRCLE NUMBER 60

they are exported, they have to go 5 miles an hour. So buyers around the world now are faced with 5-mile-an-hour cars.

So what do you think the average person would say if that were the case? I think they would say the risk of going faster is acceptable; the alternative is unacceptable. If I can't get a car from Detroit that does that, then I'll buy one from Germany or Japan.

Cryptography is not much different. You need to understand that just because criminals can use it doesn't mean we should outlaw it, doesn't mean we should let the government control it completely. We don't let the government put video cameras in our cars to make sure we don't speed or drink, just because that's dangerous and kills people. That's an intrusion of privacy. Well, there are wonderful parallels here in cryptography.

IW: *Few people anticipated the numbers that would die on the road. Are the consequences of unrestricted cryptography clear at this point, and are some of the scenarios that have been painted about widespread money laundering, anonymous assassination markets, and terrorism are very likely?*

BIDZOS: Some of that dark side of cryptography is real. You can certainly paint a picture where some of those things will happen. I think what the people who paint those pictures tend to overlook, though, is that there are other things you can do. Strong cryptography doesn't mean everybody will start getting murdered, all money will start getting laundered, and all drug dealing will immediately move to the top of the Fortune 500 list.

IW: *It already is, actually.*

BIDZOS: Well, as a whole it probably is. But people ignore the fact that there are many other things the government can do to control those kind of things. Banks are regulated; banks do electronic transfer of funds right now. Why is it that that hasn't caused a problem? Well, because there are regulations that dictate how they get done.

In a similar way, there are ways to protect ourselves. The government needs to adapt to the new world where citizens enjoy privacy. They have to find other ways to capture criminals. Yes, criminals will enjoy an enhanced ability to communicate more efficiently, and use the Internet to do it, but that's the consequence of all of us being able to do it. The upside? Everybody's privacy will be protected.

Without cryptography, criminals also will take advantage of an insecure electronic world and do terrible things. Money will get extorted, information will be stolen, people will be blackmailed—all kinds of terrible things will happen. If somebody decides they don't like you and you're leaving a digital shadow everywhere you go and it gets pretty easy to find you, that gets scary, too.

IW: *How long will it be before anonymous digital cash is widely used?*

BIDZOS: It's going to be a long time before we see truly anonymous, untraceable digital cash. That has government regulatory, social, and other implications that simply can't be dealt with in the short term.

Anonymity definitely has a place in some areas. It's nobody's business whose videos I rented or bought. It may be the bank's business or the video store's business to know that I am good for payment. If I'm going to do something for greater than $10,000, the IRS, by law, has the right to know what that is.

Within all of those existing frameworks, there is still room for some anonymity. But a world with true untraceable, anonymous digital cash and tokens that give you access to all of your financial resources, I don't see that happening in our lifetime, certainly not for many years. There are a lot of reasons for that.

IW: *Including security for its users?*

BIDZOS: That's a big one. Imagine some criminals grab you: "Gee, we've been following you, you drive a nice car, buddy, go ahead and enter your PIN number on that little token that has all your anonymous cash on it." Now they go, "Gee, Mr. Bidzos, you do very well, don't you?"

They've got every incentive to pull the trigger if they've got a gun to my head. And nobody can track them. They can enjoy it until somebody finds my body. They can enjoy flying around, staying wherever they want, and not worry about getting traced. And governments can't tax the money; they can't identify it. The economy would change. I'm not saying that's a bad thing.

Imagine a world where there's a head tax instead of an income tax. How do you tax income if it's a bunch of anonymous bits flying around the world? Maybe you just say it's $40,000 a person to live in California. Those kinds of profound changes would have to occur. The IRS and the Federal Reserve as we know it, the entire world economy, would have to go through changes. Well, just looking at what it took to make infrastructure changes on the Internet to accommodate encryption seems to tell me that that isn't going to happen for long time.

IW: *Any thoughts on how cryptography will enable the use of more network-centric devices, such as NCs and so on?*

BIDZOS: I think there is a compelling scenario where computers and encryption come together to make network computers a success. I'd like to be able to sit in a hotel room with a network computer and access my e-mail and maybe change my itinerary and do a little shopping. I'd love to have a computer for which the repository of the data was on a network. None of that can work without security.

So you're going to be carrying a smart card that will replace your existing credit card and act as a debit card, stored value card, SET card, and access–control card for the network computers. Otherwise, how will my server know that it's me who wants my e-mail? How will United Airlines know that it's me who's going to change this itinerary? How will it know that I'm good for payment? So I see a world where network computers absolutely have a place, and cryptography is what enables it to really happen.

IW: *Do you have any future predictions about what the world will look like as a result of good integration of security technology?*

BIDZOS: This technology always has been an enabling technology. People can envision new things that can be done on the Internet that couldn't really be done without privacy. Wouldn't it be great if somebody could send patient data to a physician who needs it on the spot to treat someone?

With wireless, you're talking about getting data in real time on the scene—for example, in an ambulance. Can you possibly imagine doing this if somebody can just pick it up and read it?

Look at the evolution of search engines. Without encryption, you would be able to type in "Joe Smith" and have little demons or Java applets all over the place collecting everything Joe Smith ever does—his credit card number, everywhere he goes, everywhere he browses, his medical records, his financial records—and just pull it up. That's the dark side of having no cryptography.

The world is a much better place with cryptography. I'm excited to be part of it. ■

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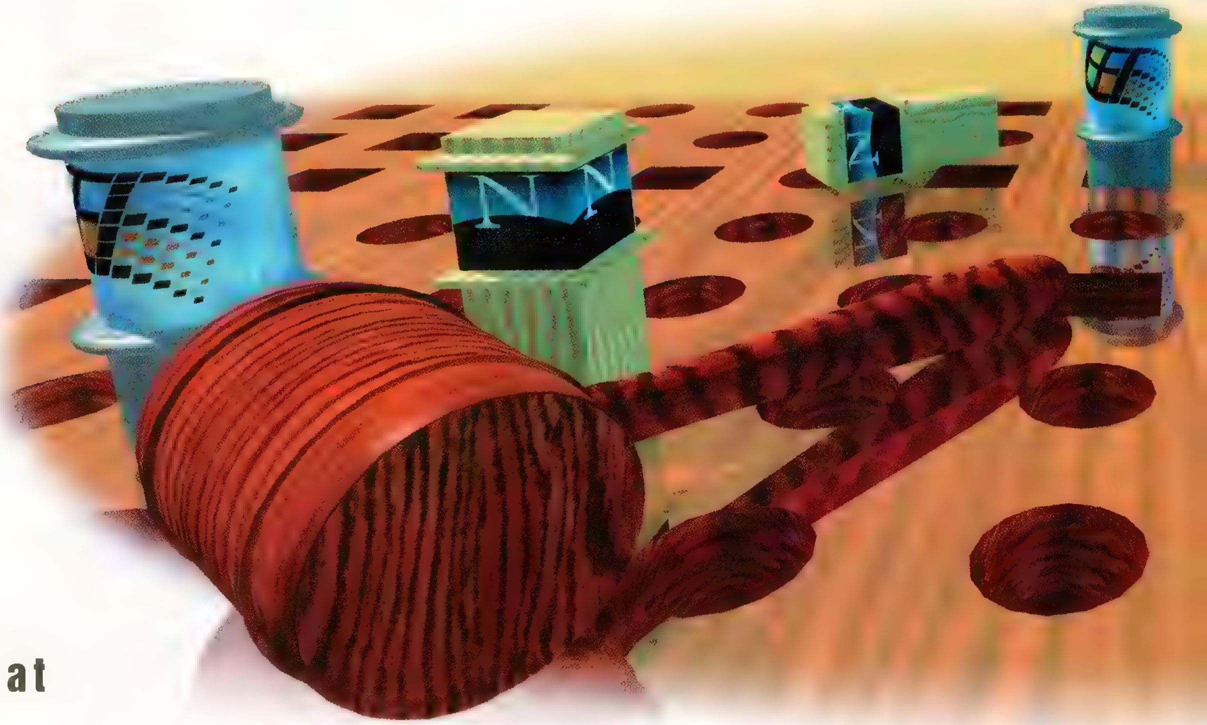


An object sharing standard that would yield Net harmony is undermined by vendors' self-interest.

BY DAVID F. CARR

A UNIVERSAL OBJECT STANDARD WOULD enable different computers on the Internet to share all data and programs. In fact, the emergence of distributed-object communication protocols as an alternative to the Hypertext Transfer Protocol (HTTP) is likely to prove one of the most significant developments in the evolution of the World Wide Web. Unfortunately, because of a standards war being waged between Netscape and Microsoft camps, it is also one of the most confusing.

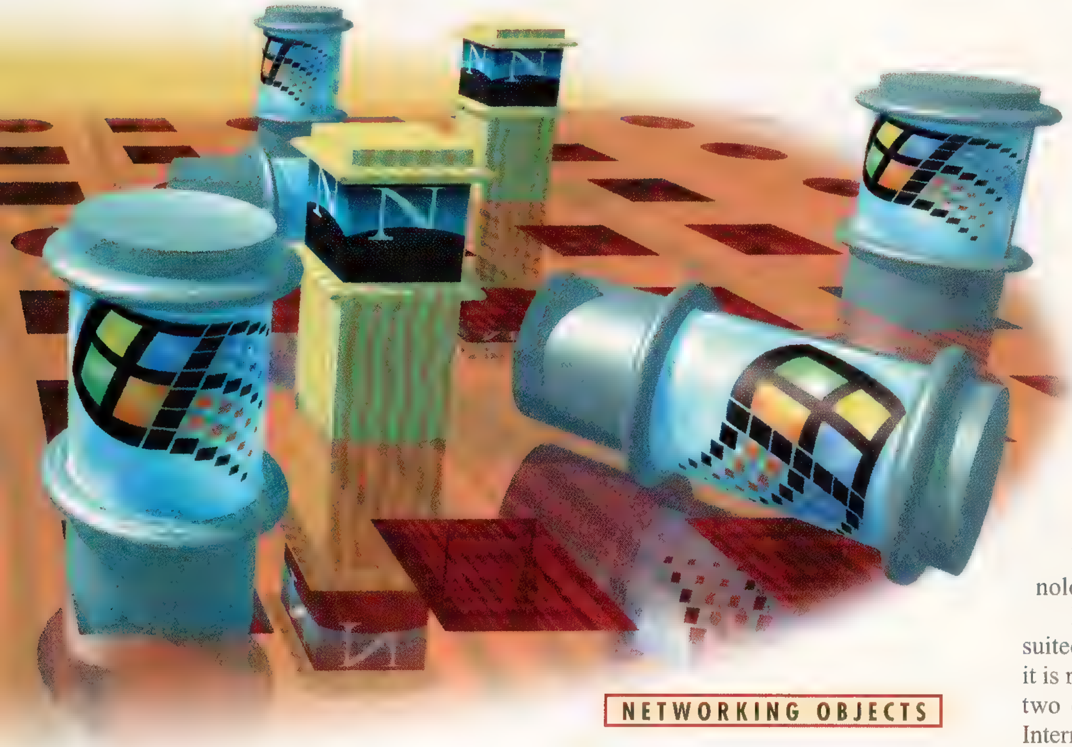
Object-oriented programming originated as a way of creating systems that model the interaction of real-world objects. Rather than writing a program as one long series of instructions, object-oriented programmers divide a system into "classes" of objects that are responsible for maintaining their own functions and data. Thus, in a flight simulator, an aircraft is an object composed of subordinate objects, like "rudder," "engine," and "joystick." In a banking system, some objects might be "ATM" and "account." Each object is a semiautonomous building block of code.

Individual objects communicate with one another by sending messages. Each object has an interface, which essentially consists of all the messages it understands. When the ATM registers a deposit, for example, it sends a message to the account object using the number of dollars deposited as a parameter.

OBJECTIFYING THE WEB

So why is this useful, and what does it have to do with the Web? Object technology allows computer applications to be quickly assembled and flexibly redesigned out of reusable objects. Objects are reusable if they can be employed in a variety of contexts. For example, both the checking account and savings account need an account object. To do this you might create a general-purpose account class that has checking account and savings account *subclasses*.

WARS



Reuse minimizes the amount of code that has to be written to create new applications. The maintenance advantage of object technology also stems from reuse. For example, if a business has 100 applications, each of which contains its own routine for calculating the difference between two dates, changing that formula would mean rewriting all 100 applications. That's part of the "year 2000 problem," in which many of the most critical business applications used today rely on date routines that don't know how to deal with the 21st century and will have to be rewritten to make sure they won't mistake Jan. 1, 2000 for Jan. 1, 1900 (see "The Year 2000," Jan. *IW*).

To make a comparable fix in an object-oriented system, you would need to make a change in only one place—the class specification for the "date" object.

First-generation objects exist within applications running on individual machines. But things get more interesting when objects can communicate across a network. This is called distributed object computing.

NETWORKING OBJECTS

Without distribution, objects are only reusable within the context of a given programming language. Also, changing the implementation of an object—as in the date example—isn't really the end of the maintenance story because you still need to install the new object on every computer on which it is used.

In a distributed object system, objects that support important parts of a business are centralized on application servers, making it relatively easy to implement changes that will ripple across many applications. For example, a bank might have several applications at multiple locations that rely on the account object. If that object includes the code for assigning new account numbers and the bank needs to change that procedure, it can implement the change in just one place. As long as the new account object responds to the same messages as the old one, the applications that depend on it should continue to run smoothly.

Ultimately, given a set of standardized objects and a consistent model of how they interact, distributed objects should make every computer system in the world compatible with every other system. Businesses would be able to form a partnership one day and integrate the supporting computer systems the next—on a level that makes today's EDI (electronic data interchange) technologies look clunky.

In many ways, the Internet is perfectly suited for accelerating this vision because it is rapidly connecting the world. Like any two objects, any two computers on the Internet communicate by sending messages encoded in protocols that both understand. And the Web has been heralded as the universal user interface for this new brand of network-centric computing.

Unfortunately, the Web was designed for sharing documents, not objects. The original mechanism for executing programs through the Web, the Common Gateway Interface (CGI), makes a browser function more like a mainframe terminal than a modern client/server interface.

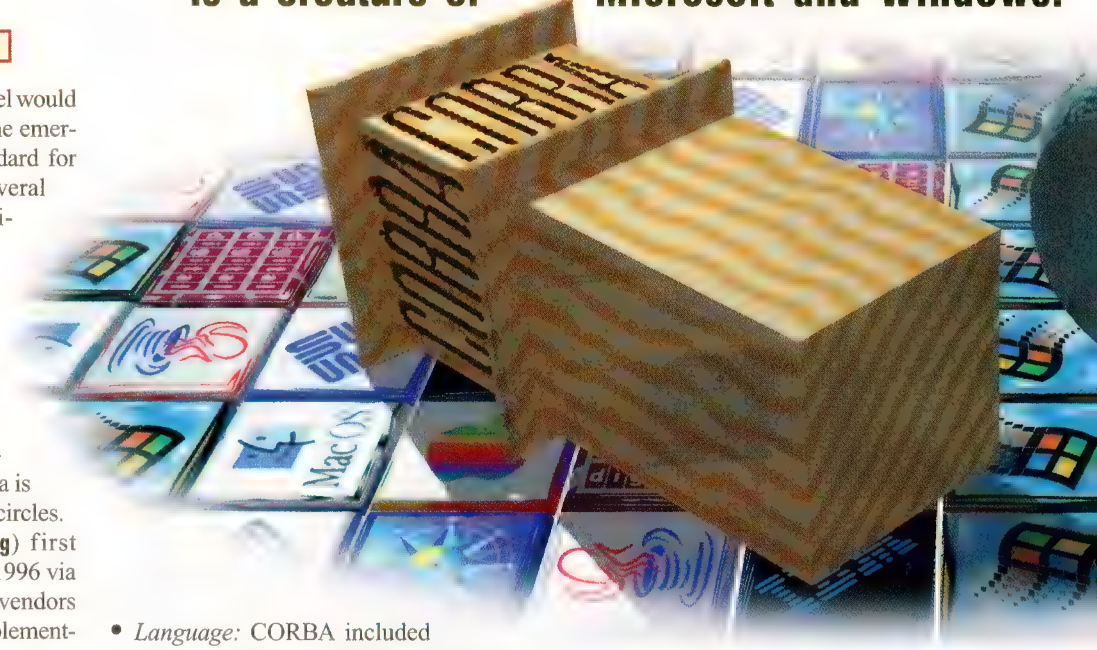
When a user fills out a form and clicks the Submit button, the browser sends the input as one long coded string of text—not objects, or even such simple data types as integers. The program running on the server may be a sophisticated object-oriented system, but its interactions with the client are limited by this communications format.

Distributed object technology can make the Web stronger and more flexible, while the Web, in turn, seems likely to boost the usage of distributed object systems. Rather than working with HTML forms, application designers can use technologies like Java or ActiveX to create components that download to

Illustrated by Scott Frommer

the Web browser. Rather than having to carry the full weight of the application, the downloadable component only needs to be responsible for interacting with the user. The client-side component then sends messages to the servers where the bulk of the application objects continue to operate.

> CORBA grew up as a cross-platform technology, developed by an industry consortium, while COM is a creature of Microsoft and Windows.



GATHERING ARMIES

The evolution of this computing model would be fairly simple if we were seeing the emergence of one widely accepted standard for sharing objects. Unfortunately, several standards are competing for dominance. The most prominent contenders are the Object Management Group's CORBA (Common Object Request Broker Architecture) and Microsoft's DCOM (the distributed implementation of the Component Object Model, or COM). The Remote Method Invocation (RMI) mechanism built into Java is also generating excitement in some circles.

CORBA (**http://www.omg.org**) first made its way onto the Web in early 1996 via the back door, when a number of vendors who supported the specification implemented their products as Java applets. One of the first of these products came from PostModern Computing, an obscure CORBA vendor. Netscape subsequently helped finance the purchase of PostModern by Visigenic Software (**http://www.visigenic.com**), then licensed the technology from Visigenic.

In late July, Netscape embraced CORBA as part of its Netscape ONE (Open Network Environment) platform for application development (**http://home.netscape.com/comprod/one/white_paper.html**).

Microsoft's Web strategy is based on ActiveX, the latest incarnation of its COM architecture, so DCOM (**http://www.microsoft.com/intdev/prog-gen/dcom.htm**) is its preferred object communication mechanism. Developers have been experimenting with preliminary versions of DCOM technology for years, but the first commercial release was included in Windows NT 4.0. At this writing, a Windows 95 version is in beta testing.

In the past, the significant differences between COM and CORBA have been the following:

- *Origin:* CORBA was developed by an industry consortium—the Object Management Group (OMG)—while COM was the product of a single company, Microsoft.
- *Platform:* CORBA grew up as a cross-platform technology, while COM was a creature of Windows.
- *Language:* CORBA included a language-independent way of describing objects, while COM was an outgrowth of Microsoft's C-compiler technology.
- *Market:* CORBA has had a hard time achieving market penetration, while COM is on every Windows desktop.

TAKING THE HIGH GROUND

Now Microsoft is moving to transfer some degree of control over its standards to an independent organization, the Open Group, and is enlisting business partners to port ActiveX and DCOM to such platforms as Unix and Macintosh. Further, James Utzschneider, the Microsoft marketing manager for DCOM, argues that ActiveX is the more language-independent technology because its components are binary files that can be created from any language.

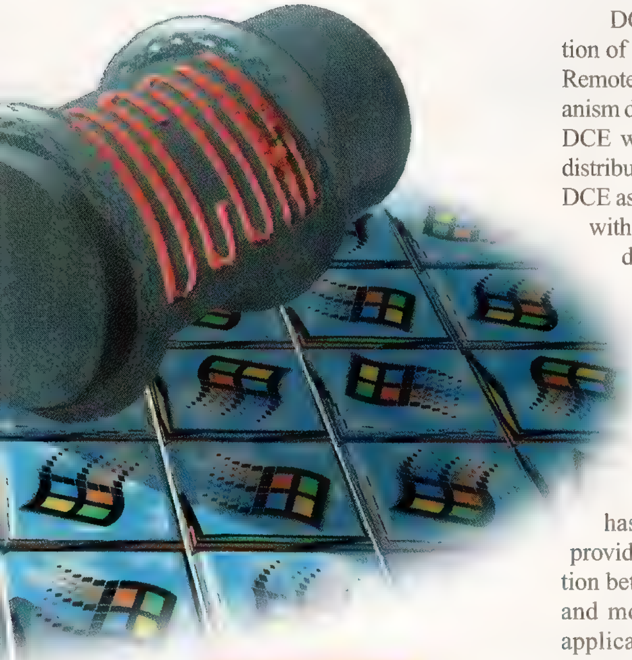
CORBA components are created within a particular language and must be mapped to a language-independent Interface Definition Language (IDL). An Object Request Broker (ORB) for one language translates a request into IDL terms, and the ORB on the remote system translates it into whatever language its components speak. Microsoft, according to Utzschneider, is unimpressed by CORBA, viewing its virtues as more theoretical than real, and is more concerned with delivering practical applications than devising a purist's vision of a distributed object system.

He said he expects DCOM to quickly overtake CORBA as a distributed object standard because "it's an extension of the ActiveX technology that exists on 80 million desktops today." Because COM already has a larger installed base than CORBA, it makes more sense for CORBA technology to move toward compatibility with COM, rather than the other way around, he said.

Giga Information Group analyst John Rymer agreed that DCOM-enabled applications will proliferate "because that's the path of least resistance" for developers with libraries of existing COM components.

But in the view of OMG architecture director Andrew Watson, this comes down to an issue of bundling. The Netscape endorsement will give CORBA the widespread exposure it needs to compete, he said. While DCOM may be more widespread on the desktop, more enterprise-level distributed object systems rely on CORBA, and the Web will make it easier for companies to build on those systems, according to Watson.

CORBA components also work on many different platforms, he pointed out. Even if the ActiveX standard begins to be supported on non-Windows platforms, developers will have to compile different versions for each one, he said.



BEYOND HTTP

Part of the interest in distributed object technologies is that they provide an alternative to HTTP. Applications based on HTTP tend to forget who they're talking to from one moment to the next. This is because the protocol is based on sending a coded request for information (the URL), waiting for a response, then breaking the connection. This is called a "stateless" connection. Application developers have found a variety of strategies for maintaining the state of a user's interactions between requests, but it remains a key weakness of HTTP.

Reliance on URLs also means the only information a Web browser can send to the server is one long string of text, which the server must parse and interpret. The CORBA solutions for the Web use the Internet Inter-ORB Protocol (IIOP). CORBA implementations can use a variety of protocols to communicate, but the OMG developed IIOP to ensure that all the products would have one protocol in common. This guarantee of interoperability among ORBs from different vendors has done a lot to accelerate the acceptance of CORBA technology.

IIOP's designers wanted it to work over the Internet or private TCP/IP networks, but it was only after the Web's significance became obvious that they began to think of it as a possible replacement for—or, at least, supplement to—HTTP. IIOP lets a browser transmit integers, arrays, and more complex objects, making it easier to construct sophisticated applications. It also helps with the state problem by giving objects on the client and server better ways of identifying one another.

DCOM uses Microsoft's implementation of Distributed Computing Environment Remote Procedure Calls (DCE/RPC), a mechanism defined by the Open Group. Like IIOP, DCE was specifically designed to support distributed applications. OMG also allows for DCE as an optional protocol that can be used with CORBA, although, unfortunately, this doesn't automatically allow DCOM and CORBA to work together.

"It's like me phoning Hungarian directory inquiries," said OMG's Watson. "I can call them because our telephone systems use the same codes, but that doesn't mean we'll understand each other."

On the other hand, Microsoft has been cooperating with efforts to provide a standard means of communication between ActiveX and CORBA objects, and most vendors of CORBA-compliant applications have come up with ways of making the two standards cooperate.

OMG Technical Director Richard Soley said it is also possible that the distributed computing standards bodies, together with the World Wide Web Consortium (W3C), will be able to agree on a new communication protocol that combines the best of HTTP, IIOP, and DCE. Even if that doesn't happen, there is little doubt that we will see some bridging technology that allows CORBA-based applications to talk to ActiveX-friendly Web clients and vice versa.

PROTOCOLS, PLUS

Defining the future of distributed object computing involves more than standardizing communication protocols. The OMG is working on an array of common services, such as security and transactions, that should be available across applications, as well as services that are specific to particular industries. Microsoft also wants to create a set of standard business components.

So, for the foreseeable future, getting the CORBA and DCOM object models to cooperate will be a challenge. The CORBA vs. DCOM debate is tightly intertwined with that of Java vs. ActiveX. Java is an object purist's development language, whereas ActiveX reflects Microsoft's philosophy on components. When you download a Java applet, you download several object-oriented classes. Those classes aren't compiled for any specific operating machine, so a "virtual machine" embedded in the browser must interpret them. Applets are designed to be downloaded each time the user accesses them.

An ActiveX component, by contrast, is a self-contained binary file, and the components must be compiled differently for every platform. They are designed to install themselves automatically on the user's system and to remain there until the user specifically uninstalls them.

CORBA-compliant products such as Visigenic's VisiBroker for Java (formerly Black Widow) and OrbixWeb from Iona Technologies (**http://www.iona.com**) used Java to get a foothold in the browser. And while Microsoft shows no enthusiasm for CORBA, those applets run just fine in Internet Explorer.

Microsoft's clear preference, however, is to encourage developers to write applets that rely on the DCOM facilities they can access through ActiveX.

To Java purists, the whole idea of mixing Java and ActiveX is abhorrent because applets written that way will only run on platforms where ActiveX is available. Microsoft argues, on the other hand, that it makes sense to take advantage of the large number of existing ActiveX components, allowing them to be called from Java applets as well as from any other kind of application.

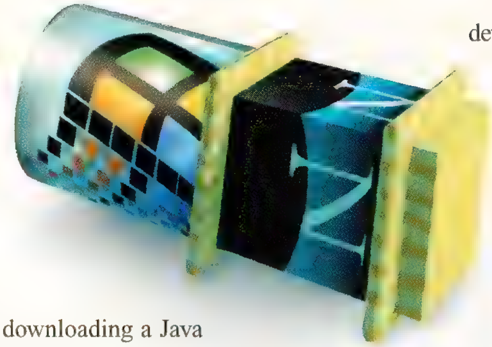
JAVA TO JAVA

With its JOE (Java Objects Everywhere) Java ORB, Sun Microsystems (**http://www.sun.com**) has shown some support for CORBA. But Sun's JavaSoft division also is rolling out a Remote Message Invocation (RMI) mechanism that allows Java objects to use essentially the same protocols for communication with remote objects they use for communication with local objects. Doug Sutherland, a corporate developer who works at a Canadian insurance company, said his experiments with RMI have convinced him that it offers a better and easier way of building distributed systems than he could get from CORBA.

Using Java and RMI, Sutherland was able to build a prototype of a Web-based videoconferencing system in just six days. "This is significant. I challenge anyone to do the equivalent with traditional tools," he said. Essentially, Sutherland would prefer to build new systems using Java and RMI and to employ CORBA only when he must integrate applications written in other languages.

Giga's Rymer said CORBA would be in a much better position if Sun had made it an integral part of its Java strategy. That is not Sun's intent, according to A. Remy Malan, director of object products

> **The best cross-platform, cross-browser solution will be Java and CORBA.**



marketing. For political as much as technological reasons, Sun expects most companies to continue to write server software in C rather than Java for the time being. "But they can very easily export the client side to Java and put it on the Web. The key to making that successful is doing it in a standardized way so you can talk to multiple vendors' ORBs, not just Sun's ORB. Using IIOP lets you communicate with essentially anyone's CORBA-compliant system," Malan said.

On the other hand, there is no reason to go through CORBA if you know that both the client and server are written in Java, he said. RMI makes distributed object computing easier in that case.

Rymer said Sun's JavaSoft division is more fanatical about RMI's supremacy than Malan's comments would suggest. Netscape is taking a more practical approach toward creating a usable platform for Java application development, Rymer said. But he believes it will take at least a year for Netscape to produce the tools that will make the technology accessible to the average developer.

CRYSTAL BALL

Put all this together, look ahead a year, and what do you get? If you tune your browser to a CORBA application, you're probably going to be downloading a Java front-end. That applet may run more efficiently under forthcoming Netscape products, which will include native support for IIOP. The applet should still work in Internet Explorer, but it may have to pull down more Java classes to achieve the same functionality.

If the application was designed to work with DCOM, you may be downloading either Java applets or ActiveX components. If the application requires downloading an ActiveX component, it will work with Internet Explorer, but making it work with Navigator is going to be a problem unless Netscape changes its plans.

Although one of the announcements at the Netscape Internet Developers Conference in October 1996 concerned a strategy for embracing ActiveX, Navigator isn't likely to make it as convenient for those components to download and install themselves as does Internet Explorer. There is, however, a plug-in available from NCompass Labs of Vancouver (**http://www.ncompasslabs.com**) that enables Navigator to load ActiveX components more dynamically.

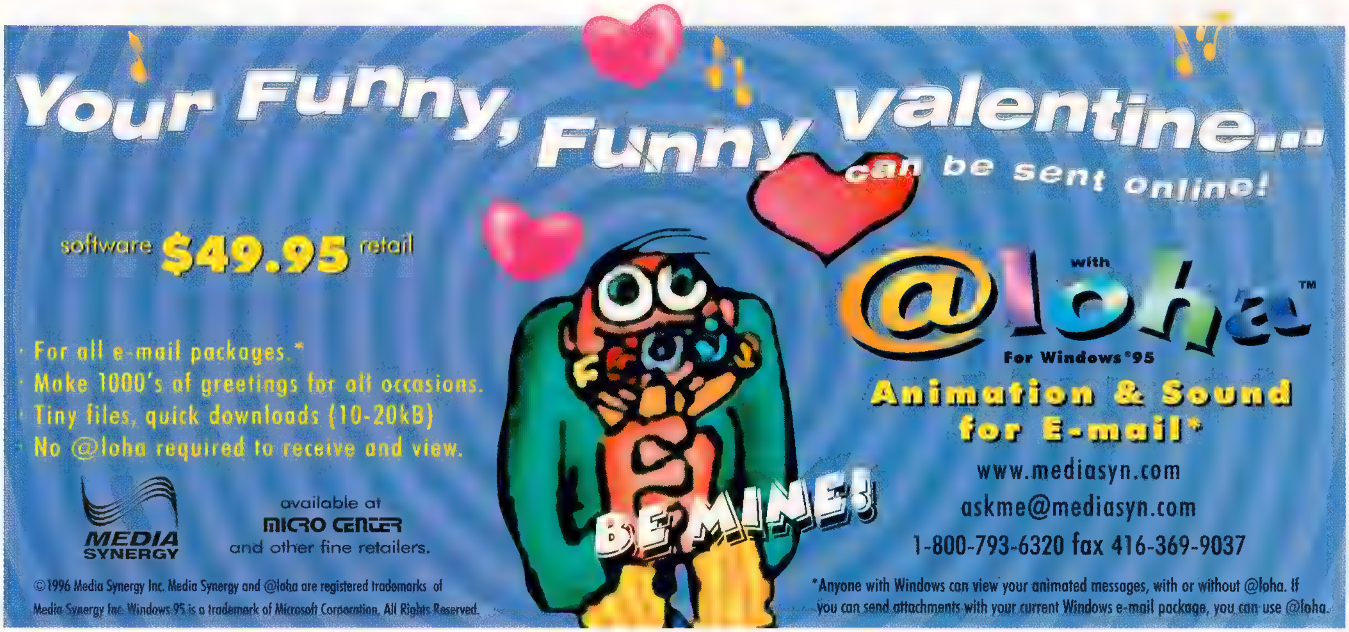
Netscape said it would extend its LiveConnect framework so corporate customers would be able to reuse ActiveX components developed with tools like PowerBuilder and Visual Basic in their intranet applications. Those ActiveX components could in turn use the DCOM facilities in the operating system, but Netscape continues to promote Java and CORBA as the more logical standard.

DCOM enthusiasts might also be able to use the LiveConnect framework to invoke DCOM from a Java applet, although that doesn't seem to be Netscape's intent.

In any case, applications that depend on ActiveX will only be cross-platform to the extent that Microsoft succeeds in making its standards prevalent outside of the Windows world. For the foreseeable future, the best cross-platform, cross-browser solution will be Java and CORBA. The ActiveX/DCOM combo, however, will be a popular choice for some firms, particularly those that have standardized on Windows. And there probably will be cases where the same application has an ActiveX/DCOM interface for Explorer clients running under Windows and a Java/CORBA interface for Netscape Navigator users, particularly on non-Windows platforms.

In the long run, as the competing factions build bridges to each other's technologies, there remains hope for the vision of a universal computing infrastructure emerging above the fray. ■

David F. Carr (davecarr@carrcommunications.com) is a freelance writer who covers database and object technology.



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Authoring tool for creating dynamic, interactive Java applets

Live Pages

BY GUS VENDITTO

7 "Instant" Java Tools Let You Bring Multimedia to the Web

The real excitement is about to begin. After months of talk about how Java will bring the World Wide Web to life (and revolutionize the rest of computing into the bargain), the first wave of products that actually delivers on this promise is finally on stage and ready for action. IW Labs tested seven products that claim to put Java applet creation within reach of everyone.

We limited our testing to Java toolkits designed explicitly to give nonprogrammers the ability to add multimedia effects to Web pages. (Other Java development programs—including Silicon Graphics' Cosmo Code, Microsoft Visual J++, and Symantec's Café—are available for programmers who understand Java's programming constructs.) The seven packages we selected for testing—Interactive Media Corp.'s ActionLine, Network Oriented Software's Activator Pro, Macromedia's Applet-Ace, Astound Inc.'s Astound WebMotion, Aimtech Corp.'s Jamba, Dimension X's Liquid Motion Pro, and Penum-bra Software's Mojo—can be used by anyone who understands multimedia file formats and is willing to experiment with menu options. Each program produces applets that can be viewed by any Java-equipped browser.

The products are a diverse group, ranging from simple toolkits that can be mastered in a few minutes to multipurpose development environments designed to create applets in which users control the material they see and that can be extended with class libraries to allow database queries and data acquisition.

In all cases, the bottom line is motion and sound, which, before the advent of Java-based tools, were available on the Web only via plug-in viewer-players (like RealAudio and Shockwave). Java not only circumvents viewers, it also offers greater control than most download-and-play technologies. Some Java development tools even let you build interactivity—such as branching through user choices, forms-style input, and/or e-mail-based feedback—into your applets.

CHOOSE YOUR LEVEL

The products fall into three broad categories: simple toolkits, presentation-oriented tools, and application-development environments.

PHOTOGRAPH BY JOHN WILKES

The simple toolkits—AppletAce and Activator Pro—reduce the process of authoring Java applets to bare essentials. You simply choose a special effect, select from a limited choice of options, and the HTML code is generated for you.

The presentation-oriented packages—ActionLine, Liquid Motion Pro, and Astound WebMotion—are modeled on more traditional multimedia-authoring software. They provide a linear, presentation-oriented environment. You start with a clean slate and add graphics, text, and sound files to your applet (each comes with some sample media files, but you can add files in standard formats). Once you have media files in your presentation, you control the interactions among elements and adjust properties, choosing from an array of special effects.

Animation is added by adding motion to any graphic or text object; you control the animation by drawing a path and setting the number of frames for the animation. As you build the applet, you can follow the progress of your work by displaying it using the built-in Java viewer. When you're finished, the software will prepare the applet for publication at a Web site by creating new folders, including the media files, Java class files, and an HTML page with the correct tags.

The most advanced programs—Jamba and Mojo—more closely resembled the environment found in visual software-development tools. As with the presentation programs, you build an applet by inserting media files (sample files are included), but you control your presentation by selecting properties for each object. Path animation is not offered. Instead, you animate text and graphics by choosing properties that control the object's initial appearance, such as a fade-in or slide-in. Because the programs stay closer to the overall design of the Java language by keeping the focus on objects and their properties, you are able to extend your applets. For example, you can use these tools to collect data or offer database queries from a Web page. Some of the tools are included with the software and others can be added with extensions.

BEST OF TEST

Considering the wide variety of approaches and techniques used by the seven products we tested for this story, identifying one package as the single best was a special challenge. Nonetheless we did have a clear favorite—Jamba from Aimtech—which not only provided the widest range of animation techiques but also had the best approach to managing objects. It lets you create heavily scripted presentations and short special effects alike without great effort. It also gives more control than any of its competitors over how the finished product is packaged for shipping: Jamba gives you the option to compress completed applets for mounting at your Web site, using either Microsoft CAB or Netscape ZIP format, or to mount them uncompressed, as the other products do. Aimtech also provides an upgrade path for Jamba with the Extension Guide, which lets you integrate database query tools or custom applets.

If you'd like to try your hand at Java without spending money, pay a visit to Macromedia's Web site (http://www.macromedia.com) and download AppletAce. This free program shows how simple it can be to use Java. AppletAce is little more than a demonstration now but we're keeping an eye on the site for updates.

JAVA PRIMER

While you don't need to know much about Java to use these tools, you should know the basics of how Java works.

Java *applets* are programs executed by a browser which has a Java *interpreter* (often referred to as the Java *virtual machine* or VM). A Java *application* is a program designed to run on a system from the operating system, rather than from a browser; the products reviewed here can create Java applets only, not applications.

A Java applet does not have a single executable file; the applet is contained within *class* files that are compiled versions of the Java source code, stored as byte code that can be processed by the VM. Most applets are spread across several class files, known as a *class library*. The applet is triggered by an HTML tag that may also set parameters used by some of the class files.

The class files define program building blocks called *objects* and their behavior and attributes, which are called *methods* and *properties*. For example, a class that describes moving text treats the text as the object; the text's movement is controlled by a method and its color is a property.

UNDER THE HOOD

To run a Java applet from a Web page, you need to insert tags into your HTML document that instruct the browser to download the appropriate class files from the server and execute them. The <applet> tag identifies the Java classes. This tag also defines the size of the window the browser will open to execute the applet. Applets that require parameters to be passed to them from the browser will need to have parameter name values included as part of the HTML tag.

Each of the Java development tools we reviewed works its magic by providing a collection of Java class libraries and a front-end that lets you set the properties and methods of the objects described within the class libraries. Once you've fashioned your applet, the programs package your creation so you can move it to your Web site. The package will contain both the Java classes and HTML code required to trigger the downloading and execution of the applet. Three of the products reviewed—Astound WebMotion, Jamba, and Liquid Motion Pro—will also manage the process of moving the class files and HTML page to a Web site. The others require you to select and move the needed files using your own software.

PERFORMANCE ISSUES

Using Java to build multimedia presentations does away with the need for plug-in viewers, but doesn't altogether eliminate the greatest problem associated with multimedia on the Web: time spent waiting for material to download. Java itself doesn't add much overhead; the class library files required by most presentations tend to be relatively slim (typically 2K to 15K). But any graphics files or sound clips contained in your presentation have to be downloaded as well, and these can be larger.

Two of the products, Jamba and Liquid Motion Pro, address this problem by packaging the entire Java applet—including media files—in either of the two popular Java applet archive formats: ZIP for Netscape or Microsoft's CAB. This speeds download and reduces server overhead by handling the whole transfer as a single process—rather than one process per file. On the same principle, if you're interested in using lots of animations, you'll want to choose a product that supports "strip animation"; in this technique the graphic is contained in a single file rather than a series of files.

PRESENT BECOMES FUTURE

As this first generation of Java multimedia development takes the stage, the next generation is already in the wings. Java Beans, a specification for interchangeable Java components, is being developed by Sun's JavaSoft division. Java Beans will make it possible for Java development tools to read the class files created by other toolkits.

Today, you select a Java-development toolkit for a combination of its interface and the types of Java class libraries it provides. Soon, you'll be able to select a development tool for its interface alone, acquiring the Java Beans you need elsewhere.

While not all Java class libraries will be moved to the Java Beans specification, the most popular multimedia techniques are sure to be written as Java Beans. Most of the programs reviewed here pledged to support Java Beans in future releases.

The promise of interchangeable components can only enhance the appeal of Java. Today, you can add sizzle to any site with only a few minutes' work by selecting objects and properties within your toolkit; tomorrow, if your toolkit doesn't have the special effect you want, you'll acquire it elsewhere and plug it into your applets.

Until then, you have plenty of options to choose from. The seven products we tested all have unique personalities and deliver different sets of components, but each makes it possible to tap the promise of Java today, with only a modest investment of time. For most Web developers, the biggest problem will be deciding which one to try out first.

THE REVIEWS

ACTIONLINE 1.1

Interactive Media Corp.

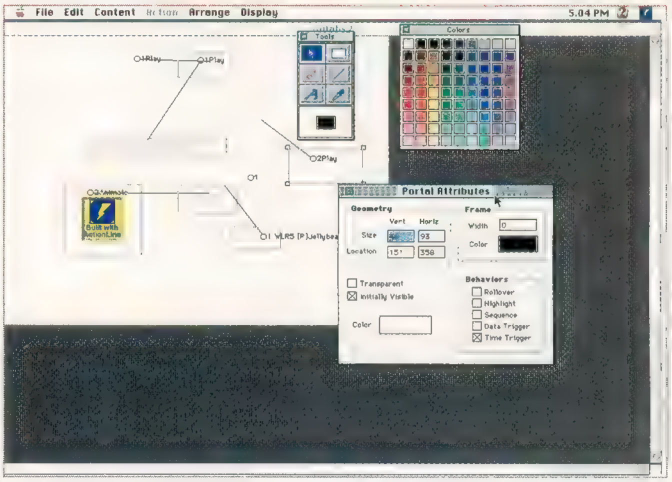
If your main multimedia objective is to display animated presentations at a Web site, ActionLine may be the best tool for the job. This Macintosh-only program can quickly create interactive displays using text, graphics, and sound. ActionLine has the most freeform interface of any of the products we tested. You build your presentation in an open workspace, inserting files and building links to other files. An ActionLine presentation is actually a sequence of events. The first file provides a link to the second, which links to the next, and so on. Because you can have multiple links from any object, presentations can be quite varied. Any text or graphical image can be set into motion using "path" animation techniques. The program doesn't support strip or other "cel"-style animations, however.

ActionLine's interface is far simpler than those of most other products in this roundup. You're never dealing with Java objects, methods, or properties. Instead, you place text, sounds, or graphics in on-screen "portals" (ActionLine parlance for windows). You control the presentations by setting properties for these portals and the links between them.

This approach to multimedia authoring should appeal to anyone who's at all Java-phobic. Despite the simplification, we didn't find ActionLine a whole lot easier to use than its competitors.

For example, although the program let us create presentation elements quickly, fine-tuning them was less than easy. For one thing, you can't display a single list of controls for an ActionLine element, as you can with other programs. Instead, you must edit the links and object properties separately. Further, the fundamentally linear nature of an ActionLine presentation makes it great for presentations in which a user moves through a series of choices, but making animations that unfold by themselves is a lot harder. To do this, you'll need to work out a logical sequence of links from one event to the next, and you're pretty much on your own in constructing this, as ActionLine doesn't provide a visual timeline or any other tools to facilitate the process. Once we had a few portals displayed in the program's workspace, the schematic diagram of our presentation became quite inscrutable.

Further, you can't view a list of all active links and their properties; instead, you must select each link individually, make changes, and test the result via playback. You can control timing only by beginning one object's display after another has completed.



Geometry
Vert Horiz
Size 93
Location 15' 358
Frame
Width 0
Color
☐ Transparent
☒ Initially Visible
Color
Behaviors
☐ Rollover
☐ Highlight
☐ Sequence
☐ Data Trigger
☒ Time Trigger

You create presentations in ActionLine by linking objects.

ActionLine's built-in Java player was fast in displaying previews as we built our test applets. The program was not efficient in distributing the applets, however. All of the program's class libraries must be moved to the server, rather than only the files needed for the presentation at hand.

If you want to bring interactive presentations to a Web site using a Mac, ActionLine is a good tool to get you started quickly. But you won't learn much about Java with this product and you won't be able to move much beyond step-by-step displays of on-screen graphics.

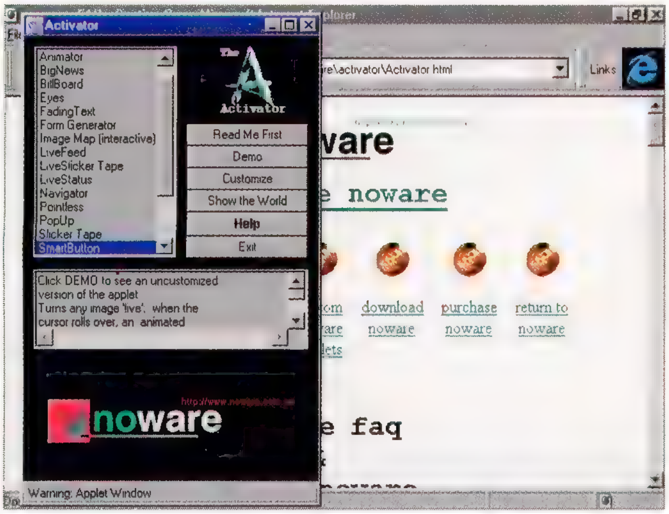
ACTIVATOR PRO

Network Oriented Software

Among Java's many promises is a world where operating systems and hardware don't matter. Activator Pro is living testament to that concept. This shareware package, essentially a collection of customizable applets, lives entirely inside the Java environment and thus is itself completely platform-independent. You download the software from the company's Web site and install it on your hard disk; it runs only through a Java-enabled Web browser. Online help, documentation, and even product registration are handled as HTML documents displayed through the browser.

Once the Java VM in your browser has loaded Activator Pro into memory, it runs as a separate task from the browser, so you can display other URLs as you work with the package. The browser, too, must remain in memory since Activator Pro's program code will need to be processed from time to time.

The program's main menu is a list of 20 applets you can customize for your own Web pages. Activator Pro doesn't require any programming experience, but to work with it comfortably you'll need to be fairly proficient in HTML authoring and Web-site maintenance (the documentation is very weak).



Click DEMO to see an uncustomized version of the applet
Turns any image 'live', when the cursor rolls over, an animated

Warning: Applet Window

The Activator Pro main menu is a list of applets you can configure.

After you've completed your customization, Activator Pro generates HTML code, using your option choices as the parameter values for the Java class libraries. Activator doesn't create an HTML page, however; you'll need to paste the generated code into an existing page. You also need to copy to your Web site the full contents of the folder Activator creates on your hard disk—several dozen class libraries and a handful of GIF images required by the applets—about 75K in all. The company says that in the next version Activator will require users to copy only the class libraries used in the applets being mounted.

The applets themselves cover a wide range of functions. For example, SoundZone adds an audio clip to an image file, which plays any time a mouse passes over the image. LiveStatus displays a scrolling text message in a browser's status bar. Starfield displays an image you select against a backdrop of moving stars (you can control the speed and color of the moving stars).

One of the more utilitarian applets lets you build a spreadsheet complete with basic arithmetic functions, choosing the values or formulas to appear in each cell; for example, you could invite users to choose the best interest rate by entering a multiplication formula in one cell and labeling other cells to direct the proper input.

Aside from the options presented in Activator's customize screens, you can't edit the functions. The program doesn't give you access to the source code or allow you to control any other display options. When you register the software ($79), you buy a license to distribute the applets on your own Web pages. If you don't register, any applets you run at your Web site will display an "unregistered applet" message to visitors.

The IW Labs test found Activator Pro a useful utility and an interesting approach to software distribution. It takes the shareware concept into the era of Java programming.

APPLETACE 1.0

Macromedia Inc.

Macromedia almost singlehandedly brought multimedia presentations to the Web with its Shockwave plug-in player. With AppletAce 1.0—which appeared on the company's Web site last fall without much fanfare—Macromedia demonstrates that it clearly understands how to distribute Java animations on Web sites. Sandwiched between the choice for downloading the Shockwave player and a demo copy of Backstage Desktop Studio, AppletAce is offered free without restrictions or expiration dates. We're not sure whether or not the program is an indication of things to come from Macromedia, but after trying out its small range of options, our reaction is "Give us more!"

The most limited program in this roundup, AppletAce is little more than a front-end for setting parameters in four modest Java applets provided by Macromedia. With AppletAce, you can configure a scrolling text banner, display a bar chart, animate bullet points, or create a clickable image map.

The software lets you choose options for each applet. For example, you can blend colors to form a gradient pattern and set transition speeds for the animated bullet points. AppletAce will then preview the applets using the options you selected.

When you're finished refining the applet, you save the HTML code and insert it into your Web page. Each of the applets comes with its own class libraries. Copy them to your Web server with the edited HTML page and you'll have created the world's easiest Java special effects. You don't have to learn anything about Java to build your applet; all you need to do is pick items from dialog boxes.

After you've tried each of these small programs, you'll probably be eager to see more. So far, Macromedia hasn't said whether it will add modules to AppletAce or develop the concept into a more complete product. But the potential for an entire product line seems clear.

Our advice is, grab it while you can. Whether you're just toying with the idea of adding Java applets to your pages or you're a collector of applets, it's the best deal around and a design we hope is the seed of a long-lived product family.

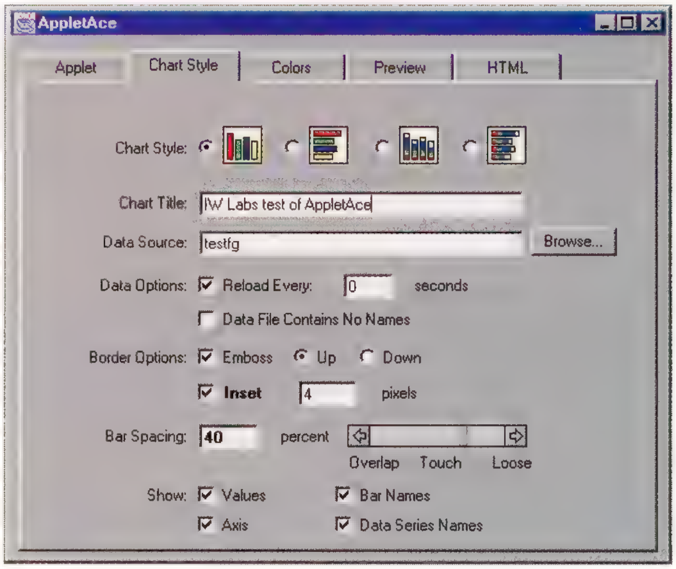


Chart Style: ● ○ ○ ○
Chart Title: IW Labs test of AppletAce
Data Source: testfg
Data Options: ☑ Reload Every: 0 seconds
☐ Data File Contains No Names
Border Options: ☑ Emboss ● Up ○ Down
☑ Inset 4 pixels
Bar Spacing: 40 percent
Overlap Touch Loose
Show: ☑ Values ☑ Bar Names
☑ Axis ☑ Data Series Names

AppletAce is the easiest program to learn of the products reviewed. All options for the Java applets are set in dialog boxes.

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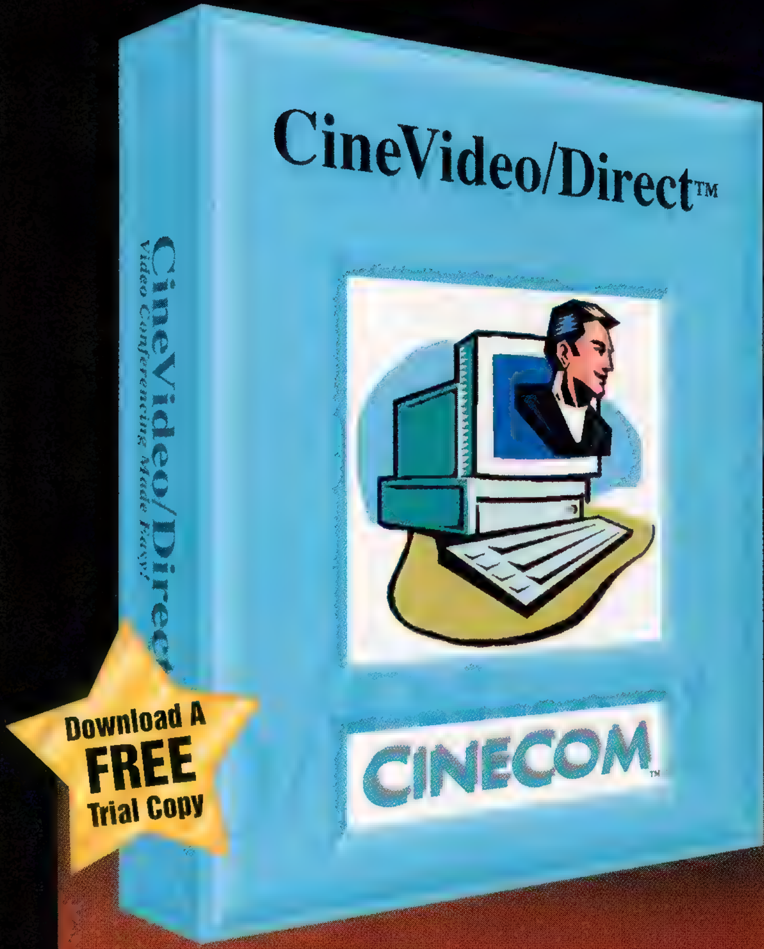
ViewPort
File
Help
Heather Taylor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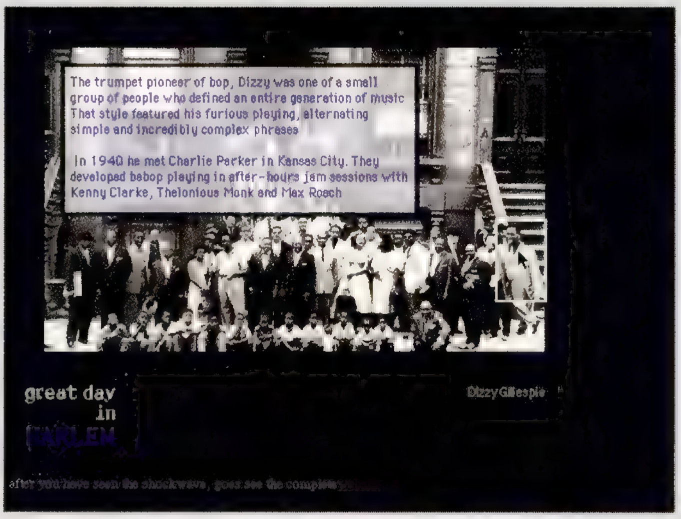
CIRCLE NUMBER 42

THE PLUG-IN PATH TO MULTIMEDIA

Before the hype of Java coalesced into palpable products, the only path to multimedia over the World Wide Web was plug-in technology. For several reasons, this alternative to the Java revolution is still attractive. Developers can continue to use authoring tools they've been using for years and just shrink and compress graphics and sound files they've already created. Web surfers download and install the plug-ins and are able to enjoy different media types that they support. While we may all look forward to a world in which we don't have to go to the trouble of downloading and installing them, plug-ins are still popular.

Since it appeared around the time of the beta versions of Netscape 2.0 well over a year ago, Macromedia's Shockwave (**http://www.macromedia.com**) has become the granddaddy of this technology. The Shockwave plug-in, which has been downloaded by literally millions of surfers, allows developers to use the robust capabilities of Macromedia's authoring tool Director, (which is aimed not at professional artist or designers but at nonspecialist "producers") to create Web-ready animation, navigation tools, and games. The advantages of Shockwave over programming in Java are a flatter learning curve and the ability to smoothly reuse content that was developed for other media, such as CD-ROM. This past summer, Macromedia enhanced the Shockwave environment with audio-compression technology that allows CD-quality streaming audio playback .



The trumpet pioneer of bop, Dizzy was one of a small group of people who defined an entire generation of music That style featured his furious playing, alternating simple and incredibly complex phrases

In 1940 he met Charlie Parker in Kansas City. They developed bebop playing in after-hours jam sessions with Kenny Clarke, Thelonious Monk and Max Roach

A rare moment in jazz history (see URL, below). Mouse over Dizzy, Monk, or Mingus and you hear their music. Click, and you can read all about 'em.

More recently, other plug-in multimedia tools have appeared including Astound (**http://www.astound.com**) and mFactory's mTropolis (**http://www.mfactory.com**). Astound (formerly Gold Disk) is a traditional, easy-to-use graphics package aimed primarily at developing corporate presentations and demos with multimedia elements. mTropolis (using the mPire plug-in) is more an industrial-strength object-oriented authoring tool used by game companies like Rocket Science Games (**http://www.rocketsci.com**) and Activision (**http://www.activision.com**). While powerful, mTropolis has a simple interface that allows new users to produce animation and basic interactivity within an hour or two. While both of these tools might be great solutions for their markets, the problem with using them on the Web is that the number of user-installed plug-ins is tiny compared to Shockwave.

INSIDE TRACK

Intranet is quickly replacing *Java* as the most hyped word in computing. Internal networks, with their almost limitless bandwidth, are fertile ground for the use of proprietary plug-in-based multimedia. If you already have presentations produced in Astound, for example, porting them to your company's intranet is a simple matter. To share presentations with clients, point them to the plug-in and give them a password-protected URL. Even more exciting are the messaging and encapsulation capabilities of mTropolis, which doesn't require nearly the level of development effort of Java. These make it a great tool for creating networked applications that feature multiparticipant conferences for projects as diverse as a network-based chess game or a real-time learning environment with different permissions for students and instructors.

Since network administrators can control the browsers and plug-ins users have at their disposal, it's a natural choice to use one of these authoring tools to create multimedia content for company intranets. Peter Fierlinger of Turntable Media (**http://www.turntable.com**) produced an intranet project for Levis using Shockwave for the entire project. "Java would have been more challenging to develop with and still would not have offered as robust an animation and compositing engine as Director did," he said. Fierlinger was also impressed by the audio-compression technology, using it for speech on the Levis project and for music on his company's Web site.

Clearly, plug-in-based multimedia content on the Web is not going away anytime soon. Tools like Director and mTropolis have an established base of developers who already have content they can put on the Web and the ability to create more in an environment that is comfortable for them.

SHOCKING SITES!!

Here is a select list of public sites where you can get the full flavor of the capabilities of plug-in-based multimedia (specifically Shockwave, the field's overwhelmingly dominant product).

- Macromedia's own gallery; effects the company thinks makes it look good: **http://www.macromedia.com/shockwave/epicenter**
- The author's own creation, pictured above; a tribute to Harlem's jazz greats: **http://www.beatthief.com/greatday/shock.shtml**
- Turntable Media's sampler of CD-quality audio; very nice interface and use of the technology: **http://www.turntable.com/hifi**
- The Collaboratorium gallery; some cool Shockwave games plus other interesting tools and links to a resources library: **http://www.article19.com/collaboratorium/shock.htm**
- Macromedia's list of Shockwave resources: **http://www.macromedia.com/support/technotes/shockwave/developer/thirdparty**
- The Shockwave tech-help mailing list: **http://www.shocker.com**

Wayne Bremser (wayneb@beatthief.com) is Web designer at Art and Science (http://www.chiba.com).

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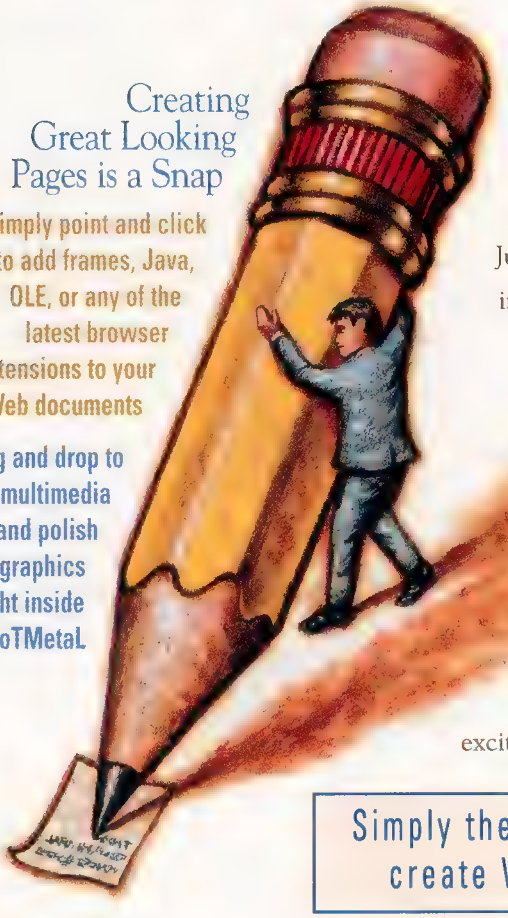

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*Price in US dollars, plus shipping, handling and applicable taxes. If you purchased HoTMetaL PRO 2.0 after March 18, 1996 for $99 US or more, then you can upgrade to HoTMetaL PRO 3.0 for free.

CIRCLE NUMBER 46

FEATURES COMPARISON

Product	ActionLine 1.1	Activator Pro	AppletAce 1.0	Astound WebMotion
Publisher	Interactive Media Corp.	Network Oriented Software	Macromedia Inc.	Astound Inc.
E-mail/URL	**http://www.imcinfo.com**	**noware@noware.com.au** **http://www.noware.com**	**info@macromedia.com** **http://www.macromedia.com**	**sales@astound.com** **http://www.astound.com/Astound**
Telephone	(415) 948-0745	not available	(415) 252-2000	(800) 982-9888
Price	$99	$79	Free	$69.95
Platform	Mac	Java browser	Windows, Mac	Windows 3.1, 95, NT
Media	Floppy	Download	Download	CD-ROM
Generates HTML file	Yes	No	No	Yes
Generates CAB library	No	No	No	No
Generates Netscape ZIP file	No	No	No	No
Generates new class libraries	No	No	No	Yes
Creates audio applets	Yes	No	No	Yes
Edits Java source code	No	No	No	No
Includes Java Player	Yes	No	No	Yes
Publishes to Web server	No	No	No	Yes
INTERACTIVITY				
Adds button controls	Yes	No	No	Yes
Adds drop-down lists	No	No	No	No
AUDIO				
Reads .AU	No	Yes	No	Yes
Reads .WAV	No	No	No	No
GRAPHICS				
Reads GIF	Yes	Yes	No	Yes
Reads GIF strips	No	No	No	Yes
Reads JPEG	Yes	No	No	No
ANIMATION				
Layer graphics	Yes	No	No	Yes
Control timing	Yes	Yes	Yes	No
Path animation	Yes	No	No	Yes

ASTOUND WEBMOTION 1.0

Astound Inc.

Users of Astound, the well-established multimedia package for desktop business presentations, will feel right at home with Astound WebMotion. This new Java-based development tool borrows heavily from its predecessor. Both programs guide you smoothly through the process of creating presentations with moving images and offer precise control over the interactions among presentation elements.

In fact, Astound WebMotion feels more like a traditional presentation program than a Java development tool. It has little in common with the other Java tools we review here except for the end result: After you build a presentation in Astound WebMotion, the included Web Installer utility generates the HTML files and class libraries for your animation.

You build presentations by controlling the behavior of "actors"—which is Astound's parlance for any text or graphical image you add to a presentation. The program guides you through the process of creating an animation with dialog boxes. Actors can be set in motion with path animation: You choose the actor and the shape of the path (curve, line, polyline, or freehand), then describe the path by clicking within the Astound stage.

Each presentation is timed; when you animate an actor, the program will add frames to the presentation. You can control the timing from one frame per second up to 100 frames per second. A timeline

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Jamba 1.125	Liquid Motion Pro	Mojo 2.0
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info@aimtech.com **http://www.aimtech.com**	**info@dimensionx.com** **http://www.dimensionx.com**	**info@penumbrasoftware.com** **http://www.penumbrasoftware.com**
(800) 289-2884	(415) 243-0900	(770) 352-0100
$299	$725	$195
Windows 95, NT; Solaris	Windows 95, NT	Windows 95, NT
CD-ROM	CD-ROM	CD-ROM
Yes	Yes	Yes
Yes	Yes	No
Yes	Yes	No
Yes	Yes	Yes
Yes	Yes	Yes
No	No	Yes
Yes	Yes	Yes
Yes	Yes	No
Yes	No	Yes
Yes	No	Yes
Yes	Yes	Yes
No	No	No
Yes	Yes	Yes
Yes	Yes	Yes
Yes	Yes	No
Yes	Yes	Yes
Yes	Yes	Yes
No	Yes	No

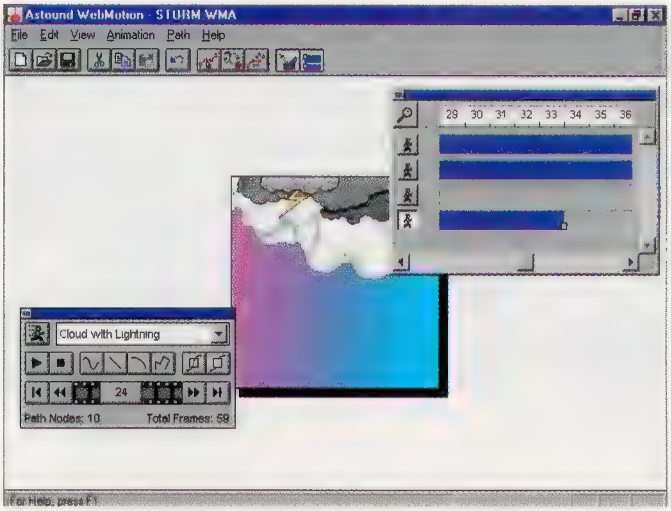
displays the intervals when each actor is "on stage." You can control the interaction between objects by sliding the timeline for each actor to a new time slot.

You can also create animation by displaying a sequence of GIF files. (The program comes with several samples.) When you insert a GIF file that's the first in a series, the program will automatically read in each of the files and insert the images. Astound is the only product we reviewed that doesn't force you to wait between 10 and 30 seconds for an applet to be compiled and interpreted before you can view it. You can view the animation any time using the on-screen VCR-style control module. Playback begins instantaneously.

Ease of use does carry a price. For example, you don't have total control over your applets. The screen size is limited to six different windows, ranging from a 120x120 pixel display to 400x400 pixels. You can add a small amount of interactivity to your applets, but the program does not provide standard interface buttons or drop-down lists. Instead, you assign an event to an actor. Only one of five of the following events can be assigned to an actor: pause the action for an amount of time you select; go to a URL; go to a frame in the animation; speed up the animation; or play an AU sound file.

The software comes with a generous collection of sample images. Unfortunately, they have a cartoonish quality more reminiscent of 1950s Sunday comics than today's Web culture. You can import graphics, including files in PhotoCD, Targa, and JPEG format. During the import process, the software allows you to combine individual graphics into an animated actor and provides limited tools for taking a single image and applying motion.

Astound WebMotion will be a revelation to those who think of Java application development as a demanding technical calling. This highly polished program completely insulates users from the objects, properties, and methods of most other Java development programs. Instead, you work in a space that's more like a video-editing application than a visual programming environment.



Astound WebMotion's strong suit is path animation.

JAMBA 1.125

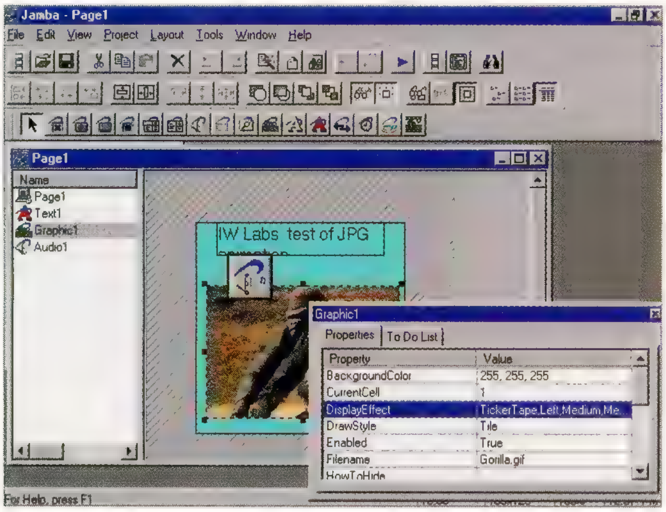
Aimtech Corp.

Aimtech officially describes Jamba as "Java authoring software," but it's really more a multimedia-presentation tool using Java as the delivery vehicle. Aimtech has a long history of developing multimedia authoring applications; its Icon Author is an advanced "traditional" environment for creating stand-alone presentations that combine animated graphics, interactive choices, and carefully timed sequences. Jamba isn't yet Icon Author's equal, but it's awfully close. Meanwhile, it's clearly the best of the current tools for creating Java-based multimedia.

Unlike some of the packages in this roundup, Jamba doesn't completely isolate users from the Java code that makes it all possible, but it does insulate them well enough that a motivated beginner can create fairly advanced presentations without getting an Excedrin headache. Jamba won't let you edit or view Java source code, but it does give you extraordinary control over the options for every property in your applets.

You don't have the feeling you're programming when you're working in Jamba. The workspace more closely resembles that of a design application than a programmer's toolkit. You add objects by selecting icons from the program's toolbars, and you can drag them from one location to another on your page. To fine-tune the look of your applet, Jamba provides tools that align objects in relation to one another or along the margins.

You control the behavior of objects in your applet by selecting menu choices. Once you've assembled the appropriate objects and hooked them together the way you want, you can test the result by running the applet. Jamba's Java player executed our test applets quickly, which gave the development environment a pleasingly responsive feel. The design of the menus, the online help, and the manual are all a cut or two above the competition.



Property	Value
BackgroundColor	255, 255, 255
CurrentCell	1
DisplayEffect	TickerTape,Left,Medium,Me...
DrawStyle	Tile
Enabled	True
Filename	Gorilla.gif
HowToHide	

Jamba displays properties for each object in menu boxes.

You can't create true path animations in Jamba, but you can add motion to text or graphics objects by selecting special effects to be used while the objects move on- and off-screen and for displaying them while they're stationary. Jamba provides 53 display effects for text and graphics that range from ticker-tape scrolling to dissolves (many of the 53 effects are choices for the shape used in a dissolve).

Not only does Jamba let you display strip animations, it makes the process of adding a strip animation significantly easier than any other program reviewed here by providing an accurate preview of the image as you add it to your applet. Jamba also updates the image as you set the image display properties, so it's easy to choose the correct number of columns and rows to use in displaying strip animations. With other programs, you have to know the right settings before you set image-display properties.

The Jamba CD-ROM contains ImageLab, a bare-bones graphics editor you can use to convert a single image to a strip animation. You can't draw or paint in ImageLab, but you can crop, flip, resize, and rotate images to build a sequence of frames from a single graphics file. Also, ImageLab lets you capture on-screen images or display disk files in most popular graphics formats. (The CD-ROM also includes 10MB worth of sample applets, graphics, and sound files.)

Jamba provides the best tools for distributing your finished applets. Both Jamba and Astound WebMotion include publishing wizards similar to those found in the best HTML authoring programs, but Jamba goes one step beyond Astound: When you move an applet to your Web site, you can choose to generate files in uncompressed Java class libraries (the same format other programs use), or package the files in either of the two formats used by browsers for packaging class libraries—ZIP for Netscape or CAB for Microsoft.

Whether you want to develop sophisticated presentations or just add a little multimedia excitement to your pages, you won't go wrong with Jamba. It's the best tool for just about any multimedia Java development you're planning.

LIQUID MOTION PRO

Dimension X

Liquid Motion Pro has a lot in common with Astound Web Motion: Both programs provide ready access to basic animation and scene-building tools, with emphasis on path animation and control over timing. You never deal with Java code or class libraries until after you've finished constructing your presentation and are preparing to publish the files on a Web server. The similarities extend even to a publishing wizard that moves the HTML files, class libraries, and resource files to the Web server.

The two are dramatically different, however, in their approach to creating presentations. Liquid Motion Pro (LMP) is much more in the camp of professional development tools like Jamba and Mojo, and this is reflected in its interface. Every object added to a presentation is listed in a pane to the left of the scene you're creating. You control the properties and events for each object with dialog boxes.

This approach proves superior, in our view, because in our tests we were able to create presentations more rapidly and exert a finer level of control over most aspects of the animation with LMP than with WebMotion. And Liquid Motion's Java player is fast; after the file is loaded into memory, scene replay is instantaneous.

TEST METHODS

Our test scripts created scrolling text and scrolling images in all programs. In the packages that provided more advanced tools, we attempted to build interactive presentations that allowed users to control the flow of the presentation. One presentation lasted 5 seconds and the second ran for 30 seconds. Both .AU and .WAV files were played, GIF (standard and strip animations) and JPEG files were imported.

In testing the applications, we played each applet using the software's own Java player (if available), Netscape Navigator 3.0.1, and Microsoft Internet Explorer 3.0. 1.

The seven Java multimedia toolkits were tested in IW Labs on a Compaq Prolinea 590 running Windows 95 and a PowerMac 7200/75 66 running System 7.5.3 as workstations, and a Compaq Proliant 15500 server running Windows NT and Microsoft Internet Information Server.

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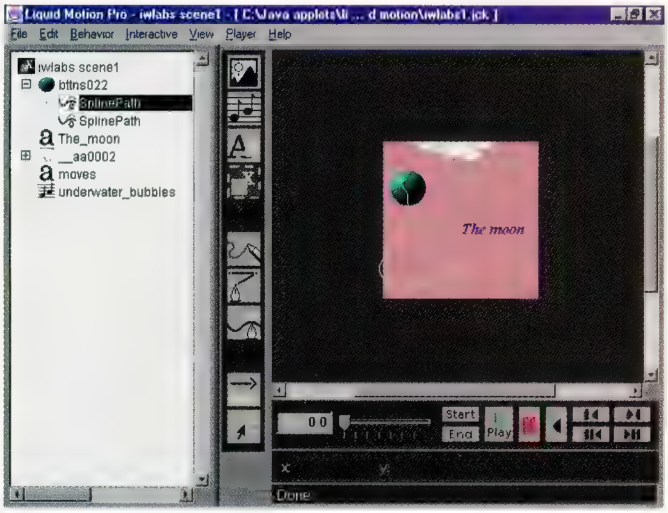
Most of the special effects in LMP are created with path animations (which the program calls "behaviors"). You can trace a path using straight lines or spline curves or draw a free-form path. There's also a "jump" command that lets you assign a random path to an object.

The software offers a limited amount of interactivity. It does not come with button controls or drop-down lists. Instead, you can trigger the display of text or graphics, or play a sound file when certain conditions are met, such as a mouse passing over an object, a mouse clicking on a graphic, or when another event completes. You can also trigger events that give users control over the pacing of a presentation, launch a different presentation, or to direct the browser to a different URL.

While the program itself is well-designed, its documentation is not. The manual is badly organized and poorly written. Explanations of even simple concepts are confusing. The on-screen Help is not context-sensitive (text in the Help menus is contained in HTML files that loads in your default browser). The documentation is on a par with software offered for less than $100, not a product priced at $725.



Liquid Motion Pro has excellent path-animation tools.

More troubling are the system crashes we experienced. Although we were using the officially released version of the software, we experienced system freeze-ups when using sample media and running the tutorial. During the creation of our test applications, however, Liquid Motion ran without problems.

While we were testing Liquid Motion Pro 1.0, Dimension X was working on a maintenance upgrade planned for release soon after we went to press. If the company can fix the stability problems and develop documentation worthy of the program's substantial price, LMP will have a bright future.

MOJO 2.0

Penumbra Software

Mojo 2.0 is more than a multimedia-development tool. In addition to providing the standard Java class libraries for playing sound, animating graphics, and scrolling text, the package includes Java classes for creating SMTP

ANIMATION IN A GIFFY

For interactive applications, Java is great, but for straight animation, it doesn't hold a candle to GIF, the standard format for displaying graphics online. Just a year ago, the fact that GIF supported simple frame animation—and that Netscape Navigator would display it—was virtually unknown. Web pioneer Royal Frazier created an animation using a commercial GIF editing program and was quite surprised to find that it "ran" in the new Navigator browser. Frazier spread the word on his site and a Web phenomenon was born. Today—12 months later—GIF animation is firmly established as a mainstream multimedia technique for the Web and, on everything from teenagers' home pages to the likes of AT&T, it's being used in ever more creative and compelling ways.

Basically, an animated GIF consists of multiple images and "control blocks" that hold instructions for their display—all defined in the GIF89 spec. To build a GIF animation, you need a GIF editing program (see Resources, below) and some images to animate: Import your component images, set options like interframe delay, disposal method, and looping, and save the file. Once placed on your HTML page, it runs automatically on download.

Here are GIF animation's principal strengths:

- No programming. GIF editing packages let you easily add images to animation files and control their behavior.
- No plug-ins. Animations "just work" in up-to-date browsers (Netscape 2.0 and higher and most versions of IE).
- No waiting. As soon as the first frame of a GIF animation finishes downloading, it displays.
- "Difference animations." This technique lets one frame serve as background to other moving images, increasing animation possibilities while keeping file size compact.
- Transparency. As with static GIF89a images, a color can be set as transparent.

For all these reasons, GIF animation has been widely and enthusiastically embraced by Web developers from the most out-there graphic designers to the most mainstream corporations.

GIF ANIMATION RESOURCES

- *Deconstructing Web Graphics* by Lynda Weinman (New Riders) **http://www.lynda.com**
- *GIF Animation Studio* by Richard Koman (O'Reilly & Associates) **http://webreview.com/books/gif/Software**
- GIFBuilder; freeware (Macintosh) **http://iawww.epfl.ch/Staff/Yves.Piguet/clip2gif-home/GifBuilder.html**
- GIF Construction Set; Alchemy Mindworks (Windows) **http://www.mindworkshop.com/alchemy/alchemy.html**
- Microsoft GIF Animator; freeware (Windows) **http://www.microsoft.com/imagecomposer/**
- PhotoImpact GIF Animator; Ulead Systems (Windows) **http://www.ulead.com**
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Richard Koman is general editor of O'Reilly & Associates' Web Review Studio Series and author of its premiere volume, GIF Animation Studio.

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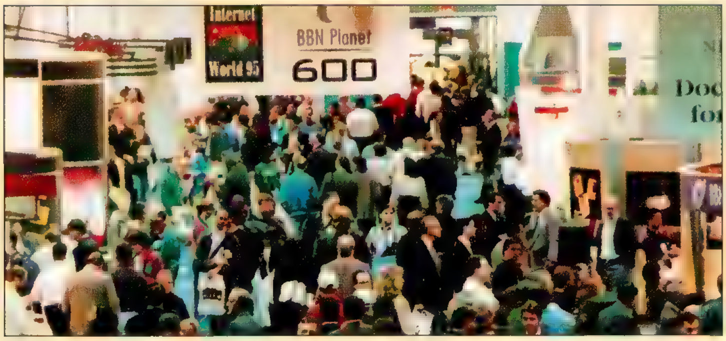
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messages, on-screen clocks, and database queries.

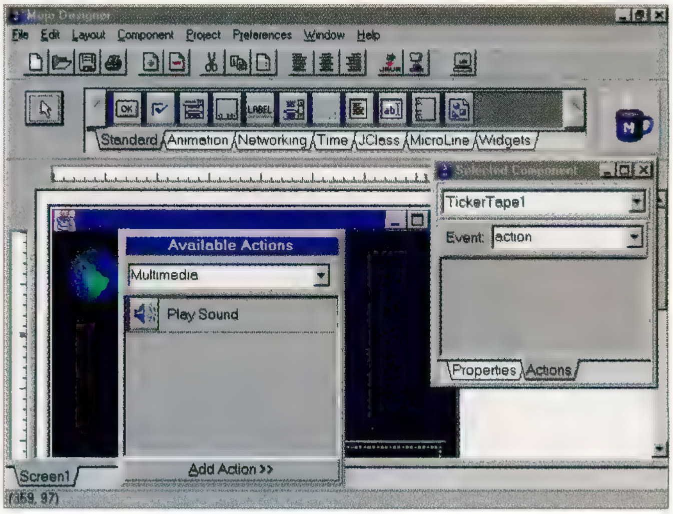
Nonprogrammers certainly can create multimedia applets using Mojo, but it'll take them a little longer than it would with most of the other programs in this roundup. Mojo's interface and documentation, geared to experienced developers, are likely to baffle novices. The manual helps you quickly begin a project but doesn't help much in getting you to the finish line. The program provides four different commands for "running" your projects but only cryptic explanations of how you move a completed application to a Web server. On the other hand, anyone interested in digging into Java for developing a variety of specialized applets—and willing to spend a few days getting the hang of Mojo—should find the program a good investment.

Mojo consists of two components—the designer and the coder—which allow you to work on a project from different perspectives. The designer is a drag-and-drop environment where you add objects to an applet by dragging icons into the active window, then setting their properties from pull-down menus. The coder displays the source program for the same project.

You can switch freely between the two modules as you work, using the coder to edit the code directly—or just to learn how Java programs are created. In our testing, we often used the coder to confirm whether an object we were trying to add to our program was actually added. (The designer gives you ready access to objects and properties; unfortunately, it rarely confirms whether you've completed the task of configuring a new object.)

Mojo provides an on-screen preview component, but it's often out of step with development work. For example, when we were creating a marquee applet to display a graphic surrounded by moving lights, Mojo didn't display the graphics file we selected in the designer. To find out if your choices will work, you need to compile the project and preview it—which takes about a minute. Mojo does get it right on some functions, though; the animation objects display the selected graphic file and property selections.

Mojo has a number of rough edges that, while not fatal, are nonetheless annoying in a $195 product. Many of the drop-down lists for setting properties are too narrow to display the entire selection (for example, the background-color property lists "color.mag" for magenta and "color.ligh" for light gray; the rest of the phrase is cut off). And the programmers forgot to add a "minimize" or "close" button to the dialog box for adding actions; so the dialog stays on screen after a selection is made, obscuring more important windows.



TickerTape1

Event: action

Multimedia

Mojo's interface is closest to the Java object model of the programs reviewed.

We were able to build multimedia presentations in Mojo, but they were not the most advanced. The program's play.sound object is especially weak. You can't link sound files to other events or control the length of a clip. Mojo makes short work of creating animations—once you've mastered the interface—but only if you have a series of images that are ready to be animated. The animation component will accept JPEGs, single-image GIFs, or GIF strips. When the GIFs are stored in individual files and named sequentially, it will calculate the correct number of frames automatically.

Mojo doesn't offer the best development environment or the best objects, but it may be a good compromise if you're ready to move up from products like Macromedia's AppletAce or Astound WebMotion, but aren't ready to develop your own class libraries using a full-fledged programmer's toolkit like Symantec Café. One of Mojo's strengths is its ability to import components distributed by third-party Java developers and organize them in the Mojo environment. ■

Gus Venditto is Director of IW Labs and author of Webheads Guide to Netscape *(Random House).*

HOW THEY RATE

In testing the seven Java toolkits, IW Labs attempted to create the most popular multimedia effects in use at leading Web sites. Where a product had no tools for generating a given category of effect, it received an N/A.

In rating simple text animation, we looked at the options for scrolling, sliding, and flashing words. Our tests for animation with sound examined the program's ability to coordinate audio clips with the display of animated text and graphics (for example, beginning playback as a graphic reached mid-screen). The score for simple graphics animation reflects a product's ability to control the movement of a graphics file, including dissolves and scrolling. Complex graphics-animation tests required the program to animate more than one graphic or text object and control the timing of the animation. Interactive tests examined the program's ability to let a user control the flow of the presentation, submit data to the Web site, or perform a database query.

	ActionLine	Activator Pro	AppletAce	Jamba	Liquid Motion	Mojo	WebMotion
Simple Text Animation	G	F	G	EX	EX	F	EX
Animation with Sound	G	N/A	N/A	EX	EX	G	EX
Simple Graphics Animation	EX	G	N/A	EX	EX	F	EX
Complex Graphics Animation	F	F	N/A	EX	EX	G	EX
Interactive Presentation	F	N/A	N/A	EX	P	EX	F

Key: EX—Excellent; G—Good; F—Fair; P—Poor; N/A—Not Applicable (doesn't have this feature)

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By Mike Godwin

FOUL PLAY

The Software Publishers Association appears to be using strong-arm tactics to force small ISPs to settle meritless lawsuits.

It wasn't the most pleasant phone conversation in the world. However, in the course of my investigating a legal campaign by the Software Publishers Association (SPA) against Internet service providers (ISPs), my conversation with Sandy Sellers turned out to be one of the more useful phone calls I received. Sellers, vice president of the trade organization, which claims to protect the copyright interests of many of the nation's largest software manufacturers, had finally called me back in response to calls and e-mail from me to her and SPA chief Ken Wasch the previous week.

ISP
SPA
cop'y-right

They knew I was on the warpath about the lawsuits the SPA had recently filed against three ISPs, including Community ConneXion, which operates in the San Francisco Bay Area (my neighborhood), and that I wanted the facts. Perhaps Sellers delayed in calling me back because she worried that no matter what facts she gave me, they'd never be able to challenge my hypothesis, which was that the SPA had essentially invented legal claims against one or more of these defendants in a stealth attack on the ISP industry as a whole. What the SPA hoped for in the interim was to force most or all of the defendants in these cases into "settlements" that would make the SPA look as if it had been right to sue all along.

I was pretty sure of this hypothesis before Sellers called me that Monday afternoon. But what cinched it was Sellers' subsequent refusal during the call to tell me anything at all about the SPA's case against Community ConneXion. Despite Wasch's implication that all I needed were the facts to understand why the SPA's lawsuits were justified, what I found was that the organization was unwilling to disclose anything. And in further investigations, I'd found reason to believe that the SPA had no facts to support its cases and that, in reality, any full disclosure of the facts would hurt its position. What I found instead, after interviewing people at Community ConneXion as well as a number of other individuals who'd encountered the SPA, was a pattern behavior that, to my mind, would justify an industrywide, Netwide investigation of the SPA.

The SPA's apparent strategy is to sue small companies that have committed no civil or criminal wrong, but who can't afford to defend themselves in court. What makes such a strategy unethical isn't just its abuse of the legal system (the Constitution requires that the federal courts be used only for settling genuine "cases and controversies," not contrived cases), but the extent to which the SPA seems to have misrepresented the facts and the law in these cases to advance a copyright policy that could cripple the growing ISP industry.

The SPA claims its legal theories of copyright infringement derive in part from the U.S. Patent and Trade Office's White Paper recommendations on copyright, which would expand the scope both of the Copyright Act's protections and its definitions of infringement. The white paper has been bitterly criticized by legal experts and public-policy analysts for its apparently intentional omission of the First-Sale Doctrine (which allows you to resell the copy of a copyrighted work that you bought—say, a college textbook) and the Fair-Use doctrines (which outline the circumstances in which you can reproduce some or all of a copyrighted work without being liable for infringement). But not even the broadest reading of the much-criticized white paper would create the kind of liability the SPA is looking for, which includes liability for the provider when one of its users has linked to a site containing information that may be used to facilitate infringement.

Photo Illustration by Peter Horvath

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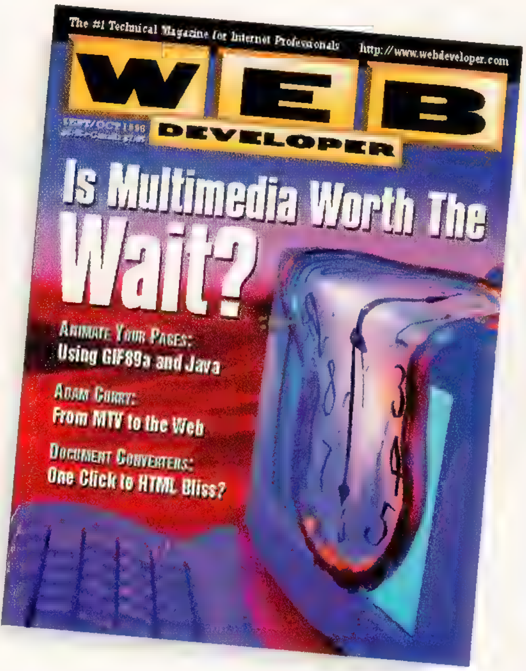
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"COPYRIGHT INFRINGERS"

It was Sameer Parekh, founder and president of Community ConneXion, whose principled, courageous stand compelled me to look into the details of SPA's strategy.

Parekh maintained that both he and his company were innocent of any wrongdoing. Even though his company is a small one, Parekh refused to agree to any "settlement" offer from the SPA and instead decided, as a matter of principle, to hire a lawyer in spite of the potential costs of defense. Shortly thereafter, the SPA formally dropped its case against Community ConneXion. This happened after my first letter to Ken Wasch, but before my phone conversation with Sellers. So when Sellers called me finally, I had something new to talk about.

IT WAS THE SPA'S RELUCTANCE TO DISCLOSE ANY INFORMATION THAT CAUSED ME TO TAKE A CLOSER LOOK.

"Are you going to apologize to Community ConneXion?" I asked her.

"No," she said after a pause. "Why should we?"

"Well, you and I both know that your case against them was a dog; there's no evidence they ever infringed against anyone. Shouldn't you apologize for saying otherwise?"

That's when Sellers stunned me by aggressively asserting that the SPA would do no such thing, that it still had a case against Community ConneXion, and that if the ISP failed to negotiate with the SPA, they'd file suit again. Despite what I already knew about the case—that the SPA apparently had no evidence against Parekh and his company—Sellers was responding to criticisms of the SPA's actions in the case by repeating the original charges that Parekh and his company were liable as "contributory infringers" under current copyright law.

Parekh's attorney, Terry Gross of San Francisco, has since criticized the SPA's refusal to admit its mistake in suing Parekh and has suggested that under the circumstances it would be appropriate for the SPA to clear the air by admitting its mistake and paying Community ConneXion's legal expenses.

But Sellers seemed remarkably defensive, which turned my attention back to the question of what the SPA was really up to. What also triggered my renewed interest was the sheer strangeness of my conversation with Sellers. For example, she continued to claim that the SPA sent an e-mail message to Parekh that gave him due and proper notice about copyright infringement taking place on or through his Web site. But when I pointed out that the e-mail in question could not possibly constitute notice (as it contained no specifics) and asked her what that evidence was, she wouldn't tell me even in the most general terms what it might be, even as she reasserted the claim that the case could still go forward. In short, Sellers was claiming that the SPA had disclosed the basis of its case while still refusing to disclose the basis of the case.

Parekh maintains that he never received the SPA's original "notice" letter in the first place, and that he only received a copy of it after the suit had been filed. It was impossible to determine from its text what content on his site could be infringing. He is correct to believe that vague allegations do not constitute due notice as the law understands the concept. Sellers claims that it was reasonable to assume that Parekh had received the notice because the SPA's e-mail to Community ConneXion "didn't bounce."

It was Sellers' reluctance to disclose any information—including information that might improve the credibility of the SPA's assertions—that caused me to take a closer look at the details of SPA's dealings with Parekh and other defendants. It began to look like the SPA had never built any real case against Parekh, and that it had done little, if any, research on him.

VOLUNTARILY COERCED

What I was able to learn about the other cases in this current program suggested a similar pattern, even though there's been a settlement in at least one of the other two cases involving ISPs. Because the evidence of any infringement was more or less nonexistent and because the SPA seemed to have given scarcely any effort to justify its case against Community ConneXion on the facts, it began to look as if the real focus of these lawsuits was not to remedy any past infringements, but simply to force some significant number of providers to agree to the SPA's own code of conduct.

The code of conduct promoted by the SPA is available on the organization's Web site at **http://www.spa.org**. Among its provisions is that ISPs agree to appoint a "compliance officer" to make sure that no one connected through the service is engaged in infringement of anyone's copyright. Because copyright infringement is rarely evident at first glance (how do you know that a copy of WordPerfect on my PC is licensed or not just by looking at it?), the compliance officer empowered by the code becomes a sort of all-purpose copyright policeman working for the SPA.

But if the SPA's goal in the litigation was never to right any particular wrong against any software publisher, what could the goal really be? I now believe the SPA's real purpose was to bring strategic litigation against poor defendants for the purpose of forcing them to seem to admit they were infringers (a victory for the SPA!) and to force them in the course of "settlement" negotiations to sign a "voluntary" agreement to abide by the SPA's ISP Code of Conduct. (Yet another victory!)

In effect, these ISPs are being forced to cop a plea and accept probation. While these "settlements" don't have any direct bearing as legal precedent, the SPA's decision to pressure these defendants into adopting a "voluntary" code of conduct (itself drafted by the SPA) may have been taken with future court action in mind. In future copyright litigation against ISPs and other access providers, the SPA could say that these "voluntary" codes amount to an industry standard of due diligence and that a defendant's failure to adopt such a code was proof at least of negligence, and perhaps even of complicity, in copyright infringement. But what the SPA won't mention is that the standard was imposed on the ISPs from another industry altogether.

So the litigation may have been designed to have a twofold effect. In the short run, having these little companies beat up in the courts by the SPA will have a chilling effect on the First Amendment rights of other providers, as well as on their users, because the providers will feel intimidated into adopting the role of copyright policeman. And in the long run, the establishment of such an "industry standard" will provide the SPA with a useful legal tool to use against larger providers like CompuServe and America Online.

It seems the long-term plan of the SPA is to create a strategic legal framework that makes it easier to sue larger defendants when the time comes. By then it won't matter so much that AOL and CompuServe have enough money to mount a realistic defense: The battle will have been long over before the first motions in those cases are filed.

The troubling aspects of the SPA's new program of aggressive litigation against ISPs emerged shortly after its litigation program

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was announced. The first cases were filed in mid-October 1996. The code of conduct currently being promoted by the SPA as part of an "education" effort was announced at the same time as its litigation campaign.

At press time, the SPA has said it is considering revising the code in response to public criticism about its current wording, which seems to put each ISP in the role not only of policing everyone's content on its own site, but also of policing every Web link from every user to see whether the linked-to sites have infringing information. In effect, the code as currently worded could put ISPs in the position of having to police content on the Net as a whole.

This is a deeply wrongheaded policy. Even if you're a service provider who disapproves of software piracy and refuses to engage in it yourself, the SPA has declared its right to sue you for not choosing to be one of its designated copyright cops.

That's the substantive criticism of the SPA's policy, but it doesn't address the ethical questions raised by the organization's litigation strategy. That strategy seems to me to be based on such fundamental misrepresentations that it has become necessary for the software manufacturers who fund the SPA to conduct a close, detailed review of the work the SPA has been doing in their names. Most of the companies that support the SPA have great track records as corporate citizens. It would be a shame to see companies like Apple and Adobe have their positive public images marred by the SPA's excesses.

I also believe that some, and perhaps most, of the SPA's backers would nix this sort of strategy if they were fully informed about it in advance, opting instead for a more straightforward debate in the policy arena rather than in the courts. The ethical problems raised by the SPA's tactics are not connected to any fundamental dispute about the scope of copyright protection. So far as I can tell, the companies that want to increase legal protection for intellectual property think their arguments are compelling enough without needing to sneak policy making through the back door of a lawsuit. I don't agree with some of the software providers' arguments, but I do agree with them that the arrival of the Net as a central force in public life presents an occasion for a full examination of intellectual-property issues. And most of us on all sides of that debate agree that the only unassailable consensus about copyright on the Net will be the one that comes from fair and open public debate.

I have to distinguish the SPA's cases—in which I believe defendants are picked largely for their relatively small size rather than because of any real liability for infringement—from so-called "test cases" in which important legal or constitutional doctrines are debated. In my view, for a lawsuit to qualify as a test case requires that there be a real test of the law or principle in question. But the only test in the lawsuits against these small, economically vulnerable defendants is the test of how much intimidation per dollar the plaintiffs can exert out of an *in terrorem* strategy.

THREAT TO THE NET

At a time when most Americans are suspicious of lawyers and critical of the legal system, this kind of strategy, which results in permanent and perhaps irremediable damage to the defendants and their businesses, is likely to cause a larger degree of outrage as more Net users and providers learn about it.

The damage to small ISPs hasn't been merely financial; there has also been serious damage to the defendants' reputations. This damage would be enough, I believe, to support a libel lawsuit against the SPA, but, of course, a defendant who can't afford to raise a legal defense against false charges of infringement can scarcely afford to finance a libel lawsuit.

Nor is the Net much help in such a case, despite what I've written previously about the extent to which the Net can serve as an alternative to a libel lawsuit. I still believe I'm correct to say that, in general, if you're libeled on the Net, you can use the Net itself to correct the record. But in cases like these, the defendants are being strong-armed into formal settlements under which they must adopt new tough-on-infringers codes of conduct, declare their willingness to violate their users' privacy by proactively snooping through their accounts, and even hire a special copyright policeman to implement this antipiracy policy. It's hard to correct the record on the Net when the other side can adduce your forced settlement as a de facto "admission of guilt."

THE SPA'S CODE OF CONDUCT SEEMS TO PUT EACH ISP IN THE ROLE OF POLICING CONTENT ON THE NET AS A WHOLE.

That's why I and others have called on the SPA to admit in public its mistakes with regard to the Community ConneXion case, to clear the air about the company's alleged infringement liability, and to repay the company's outlay for a legal defense. And that's why I'm calling upon the SPA's board of directors to conduct a detailed review of the organization's strategies and activities up to now.

Such a review would be to everyone's benefit because the potential damage caused by the SPA's open legal warfare against ISPs could extend far beyond that industry and could, ironically, damage the software companies as well. We're living in a time when many Americans are nervous about this technology and hearing scary things about it. It doesn't help to have one segment of the information-technology marketplace decide that another segment is riddled with copyright crooks who need to be brought into line. There's a natural alliance here, but it's being subverted into an unnatural antagonism. This would mean a loss for everyone as the vital forums and marketplaces of the Net are strangled by poorly crafted, overbroad policies and laws.

It may also be time for the Net to respond to this sort of campaign by starting its own "SPA Watch," a forum that actively solicits other accounts of the SPA's heavy-handedness. Such a forum could even serve as a showcase for positive uses of anonymity, which so many policymakers currently view with distrust. If you wanted to report on an SPA-related incident but were afraid of some kind of retaliation, the SPA Watch forum provider could make it possible for you to tell your story anonymously. All that such forums would have to require is that contributors limit themselves to first-person accounts, that they be as detailed as possible as to both the time of the incident and the events and persons involved, and that they explain what, if anything, they thought was unfair or oppressive about the SPA's actions.

In spite of my worries about the Net backlash, I maintain hope that the Net itself will provide the best remedies for the worst manifestations of the backlash, of which the SPA's misconceived litigation strategy is, I'm afraid, only a harbinger. An SPA Watch could serve as a model for other forums to keep the rest of us informed about threats to the Net. As is often the case, when we Netizens want something done right, we ought to do it ourselves. ■

Mike Godwin (mnemonic@eff.org) is staff counsel for the Electronic Frontier Foundation.

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By Joel Snyder

SNUBBING STANDARDS

Companies make life on the Net unnecessarily difficult by failing to support established standards and attempting to set their own.

I'm disappointed in Netscape and Microsoft. Why? Because they pay no attention to Internet standards. Their products aren't compatible and they don't seem to care. I just bought a new Intel-based PC and wanted to load Windows 95 on it. Naturally, an important part of this project was going to be making the PC an Internet workstation with all the right toys. Getting Windows 95 running was astonishingly easy. This was a prepackaged system from Digital Equipment Corp., a Pentium Celebris. I picked it because it reminded me of a Macintosh: All the bits I needed were integrated into the motherboard—video, audio, serial and parallel ports, IDE and SCSI disk controllers, and Ethernet. No running around adding bits and pieces to try to make a complete system. This system replaced an older PC that was running vintage 1995 software, including Netscape Navigator 1.0 and Qualcomm's Eudora e-mail package.

I was using both Netscape and Eudora because that was the package Netscape sold as the Personal Edition in 1995: everything you needed to cruise the Internet. For 1997, I went to the bookstore and picked up Netscape's new Navigator Personal Edition 1.2.

The first thing I noticed was that my beloved Eudora had disappeared. In its place, Netscape had left its own mail package. Now, this is not a software review, so I'll refrain from saying that Netscape's mail capabilities are about 10 steps down from what I can do with Eudora.

What I want to talk about is how the Netscape mail program ignores current Internet standards. It's not worth going into the technical details here, but the end result is that Netscape's software engineers slapped support for a preliminary standard (RFC 1806) into their product and left out the existing, well-supported MIME standard. This means that certain types of attachments lose information when read by a non-Netscape mailer. This is unacceptable. But let me digress for a moment so you can understand how Internet standards are set.

STANDARDS PROCEDURE

Internet standards are known as RFCs (requests for comments). Each RFC has a number assigned to it, and there are just over 2,000 RFCs today. In the world of the Internet, the standards are agreed upon by committees after long, educated discussions on the best way to include new technologies in the Internet in a standardized way. Most RFCs come out of committees that are part of the Internet Engineering Task Force (IETF). The committees meet occasionally in person but often are conducted via e-mail.

But not all Internet standards come out of the IETF. For example, modems are standardized by the International Telecommunications Union (ITU; **http://www.itu.ch**), which is part of the United Nations. If you have a standard 28.8-Kbps modem, it conforms to ITU Recommendation V.34 (and probably V.42, V.42bis, and others). That's a non-IETF standard in widespread use.

One complaint people make about non-IETF standards is that they can be difficult to acquire, which discourages people from implementing them properly. (To obtain an ITU standard, for example, you must call the ITU bookstore in Geneva and pay on the order of $20 to $200 each, or contact one of the few U.S. companies that have them available, usually at slightly

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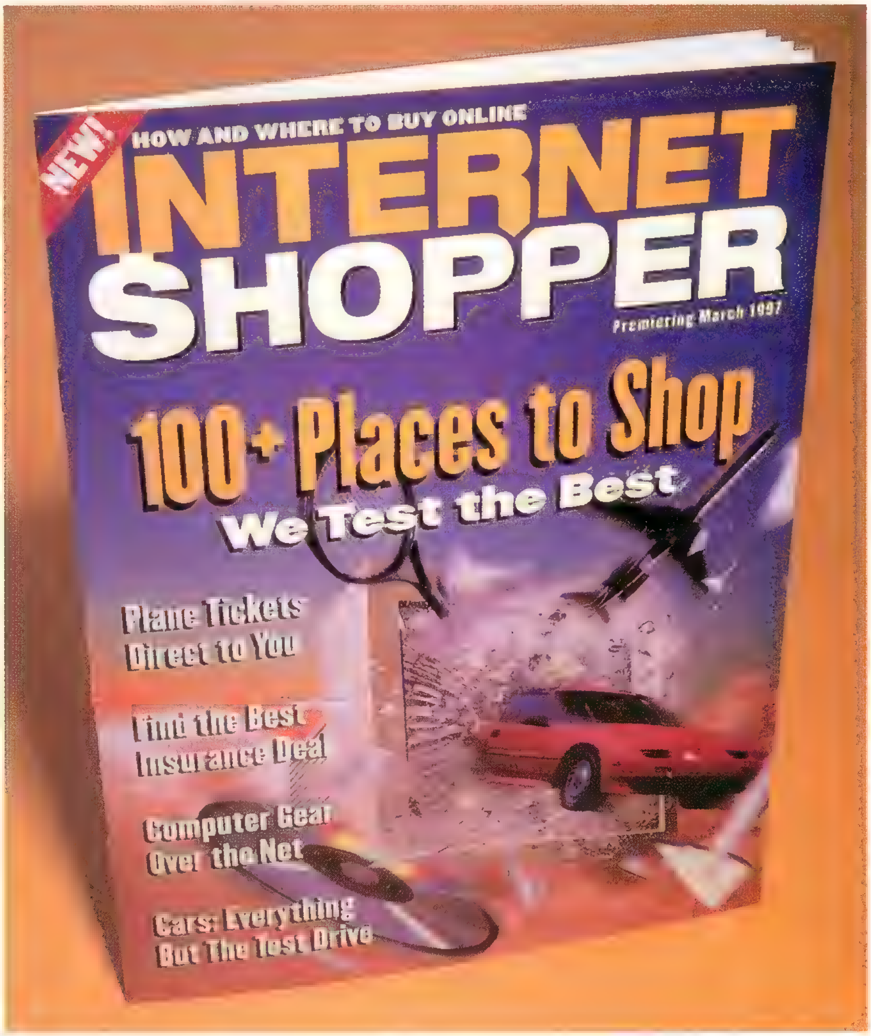
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THERE'S NO REASON FOR THE COMPANY TO HAVE BUILT THIS KIND OF INCOMPATIBILITY INTO ITS PRODUCT.

This is the basis of my annoyance with Netscape Navigator's new mail functionality. There's no reason for the company to have built this kind of incompatibility into its product. Doing so is either sloppy or anticompetitive. I tend to believe the former, although there are some paranoid folks out there that prefer the latter interpretation.

Fine. If Netscape's not going to play by the rules, there's another game in town: Microsoft. The company was kind enough to build its browser into my Windows 95 system, so all I had to do was click to explore the Internet.

Right. All I had to do was spend 30 minutes with Internet Explorer 3.0 to find out that the folks in Redmond, Wash., are even more careless than their counterparts in Mountain View, Calif.

Internet Explorer won't talk to my Usenet News server because the server doesn't support the "XOVER" command. Is this part of the standard for news servers? No, it's not. Is there any reason why Internet Explorer couldn't work without this command? Of course not. There are only six other newsreaders on my workstation, and all of them seem to survive quite well without it. But Explorer doesn't even give me the choice to work with my poor old news server. You don't support XOVER? Tough luck.

Microsoft's implementation of FTP also is nonstandard. It doesn't work with many perfectly good FTP servers. Why not? Because the Microsoft engineers weren't paying attention and didn't read the standards. I get the feeling that Microsoft's idea of testing is to connect one PC to one server and if it doesn't show a General Protection Fault, to ship the product.

Compared to the criminally poor implementation in Internet Explorer, Netscape's error is like jaywalking. I could almost forgive them, if it weren't for HTML (Hypertext Markup Language), the language in which Web pages are written. HTML 2.0 is a standard: RFC 1866. Dated November 1995, RFC 1866 describes how HTML should be written, what's legal, and what's not. If it were up to me, I'd say that writing HTML that doesn't conform to RFC 1866 should get your pages relegated to the trash bin. (The proposed specs for HTML 3.2, the newest generation of the code, can be seen at **http://www.w3.org/pub/WWW/TR/PR-html32-961105**.)

But fortunately for all those folks who use nonstandard multimedia animated backgrounds with nonstandard in-place frames and 12 different nonstandard fonts, it's not up to me. The reason people do such zany things with their pages is that the browser manufacturers—in other words, Netscape and Microsoft—let them.

THE PACE OF CHANGE

The folks at Netscape and Microsoft are completely dissatisfied with the speed at which standards are made. They couldn't possibly wait for the market to settle down, for products to become stable, and for people to have experience with a feature before it gets incorporated into 10 million Web pages. They have to have change, and they have to have it on a weekly basis. If you're a Web developer, I'm sure it puts fun and excitement in your life.

On the other hand, if you're someone who doesn't think that changing software as often as you change sheets is a good idea, these guys are putting you through the wringer and hanging you out to dry.

Another company going down this same path is US Robotics. Its x2 technology is a new way of using phone lines to increase bandwidth between ISPs and their customers. (x2 is only useful when one of the parties has a fully digital phone line, which is pretty unusual.)

Unfortunately, x2 is an outgrowth of US Robotics' research labs and has nothing to do with national or international standards. It's nonproprietary, and US Robotics has said it is submitting the protocol to the ITU. But there is no guarantee the ITU will accept the proposal, or that it won't change it.

This is a hardware equivalent of what Microsoft and Netscape have done: going ahead with a standard they like without getting external validation. And it's a lot harder to change modems than browsers.

People buying into it may not be aware of the horrible days of V.32 terbo and V.fast, the prestandard proposals for faster-than-14.4-Kbps modems. Lots of companies sold nonstandard modems in the hopes that the final standard (V.34) would match their choice. It didn't, but many people had bought the new modems without understanding that they were betting on a long shot.

It all comes down to standards. In the standards business, there's a curve that looks like a camel with two humps, with each hump representing a phase of a new technology.

The first hump is the innovation period for a technology—lots of activity, but too early to set standards because things are changing too fast. The second hump is the adoption phase—lots of sales and too late to set standards.

The right time to tackle standards is between the two humps: after the innovation but before everyone buys it. But as far as HTML goes, that model is dead. We're all reluctant beta testers for the Internet because there is no low point between the two humps. There is no good time to standardize, and the main players aren't willing to wait before releasing a new version of their software.

You could argue that the reason the Internet is growing so fast is that its fever pitch makes it exciting to join, and all this builds on itself. You could also argue that the reason we're getting so many valuable new services is that businesses look at the size of the market and want to hop on as soon as possible. But that argument doesn't hold water. I'm happy to see the Internet grow fast, but it could grow just as well at a slower rate.

My gardener told me it's dangerous to feed trees too much fertilizer when they're young because they grow too fast. An overfertilized tree becomes vulnerable to disease and weather. A tree needs to grow at a slow and steady pace to be healthy.

The Internet works the same way. The rapid pace at which Netscape and Microsoft are introducing buggy, nonstandard software is hurting us all. ■

Joel Snyder (jms@opus1.com) is a senior partner at Opus One in Tucson, Ariz.

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By Jeff Pulver

UNWIRED

A new wave of wireless telephones—including a wristwatch model—will let you send and receive e-mail on the go. Here's the scoop.

For the past year, I have been searching for an affordable wireless solution that would give me the freedom to get away from my office e-mail—without the risk of missing important messages. A few weeks ago I had a chance to spend a couple of hours with Jeff Damir, director of product marketing and management at AT&T's Wireless Data Division (**http://www.airdata.com**). During the meeting I learned how his team has been positioning the group's first wireless IP device known as the PocketNet. Would you believe you can now travel around New York City and carry a cell phone that has a static IP address assigned to it? This is a phone that somebody on the Net could "ping" to see if it was on prior to dialing the phone number assigned to it.

This wireless IP device does exist—and AT&T's Wireless Data Division is one of the companies providing the enabling technology. In addition to New York, this service will be available in more than 70 cities around the United States in 1997.

After spending time with Damir, I decided not only to evaluate the PocketNet phone, but also to consider joining the group of developers who are creating Net-based content for users of the device. The phone I used during the evaluation looked a lot like most other cell phones I've seen in the marketplace—except for one major feature: it has a four-line LCD display built into its top. Other nonconventional buttons include: Home, Back, and Help.

The secret to the potential success of this product is AT&T Wireless's ability to take advantage of cellular digital-packet data (CDPD) technology, which is available with most of the cell-phone systems in the United States. You can think of CDPD as the "data" channel of the cellular-phone system. Features of the PocketNet phone include sending and receiving e-mail; redirecting messages to a fax machine; accessing Net-based directories to look up names, phone numbers, and addresses; tracking packages from FedEx and UPS; receiving up-to-date weather conditions; and getting interactive stock quotes and news. Basic service will be between $30 and $40 monthly; the phone itself will cost around $500.

Being the skeptic I am, as soon as I got back to my office I turned on the PocketNet phone and pinged the IP address to which it was assigned. As soon as I turned off the phone, the IP address was no longer reachable. This feature impressed me. I finally could own a pingable wireless device with two-way e-mail, and I realized that wireless technologies will really have a big impact on the way people do business over the next couple of years.

UPS AND DOWNS

While the potential market for this product is pretty big, from a practical vantage point, the user interface may need to be reengineered before it is accepted by the mass market. For example, with the phone I tested, in order to write out a phrase like "ABC," I had to hit the keypad with the number-two button six times: one time for the "a," two times for the "b," and three times for the "c." As a result, while my regular e-mail messages have a tendency to be a bit long, messages originating from my PocketNet phone have been short.

There are times in which I've received more than 300 filtered messages a day, and on days when I'm on the road—speaking at a conference or consulting with a client—it is easy to get behind in my e-mail. With this product, I can give out my uniform e-mail address, **j.pulver@pocketnet.net**, and anybody can send me a message. With it I have no need to carry a pager anymore—pretty cool.

AT&T isn't the only one offering these next-generation wireless tools. Nippon Telegraph and Telephone (NTT) recently developed a prototype that sits on your wrist like a watch, known as its "Wristwatch-Type PHS Terminal." It is a supercompact wireless phone that weighs only 70 grams, including batteries. The prototype applies voice-recognition technology for dialing, eliminating the

Illustration by Chris Spollen

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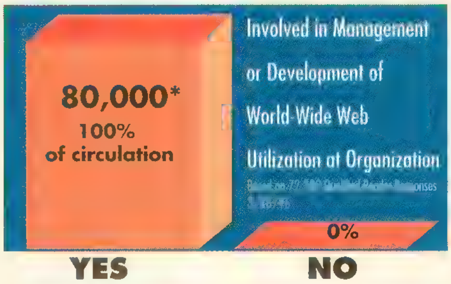

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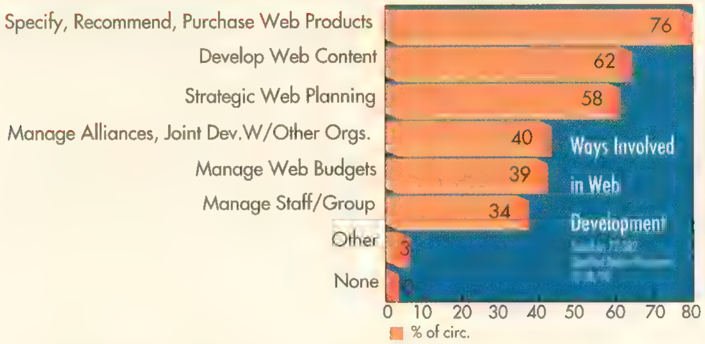

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Wynd Communications (**http://www.wynd.com**) is another company offering wireless e-mail solutions, and friends of mine who have the HP 200LX palmtop have been impressed with the reliability of service. With its text-to-speech application, you can direct a typed message to be sent as a phone call to a third party. Although the voice that delivers the message seems to have a heavy Irish accent, at least the technology is in place to deliver text messages as voice.

CHANGING THE COURSE OF BUSINESS

We live in times when enabling technologies offer paradigm shifts that can affect our lives—both personal and professional. Whether it's using a spreadsheet program, faxing a document, or sending packages anywhere overnight, we come to rely on these products and services in the course of doing business. And it is usually much easier to send someone e-mail than call, since you can send messages day or night.

One of the things that voice mail and e-mail have in common is that they are forms of asynchronous communication, and as these technologies move forward it will become increasingly important to develop controls to monitor the amount of asynchronous communication that occurs. Why?

Well, for example, there are times when I receive more than 40 voice-mail messages a day, over 300 e-mails, and about eight faxes. Except for the unfriendly "mailbox is full" message people sometimes get when they call or e-mail, we all assume that once you leave a message for someone that it is received and will be read. I'm not aware of any complete solutions that help monitor these technology ecosystems and keep them in check.

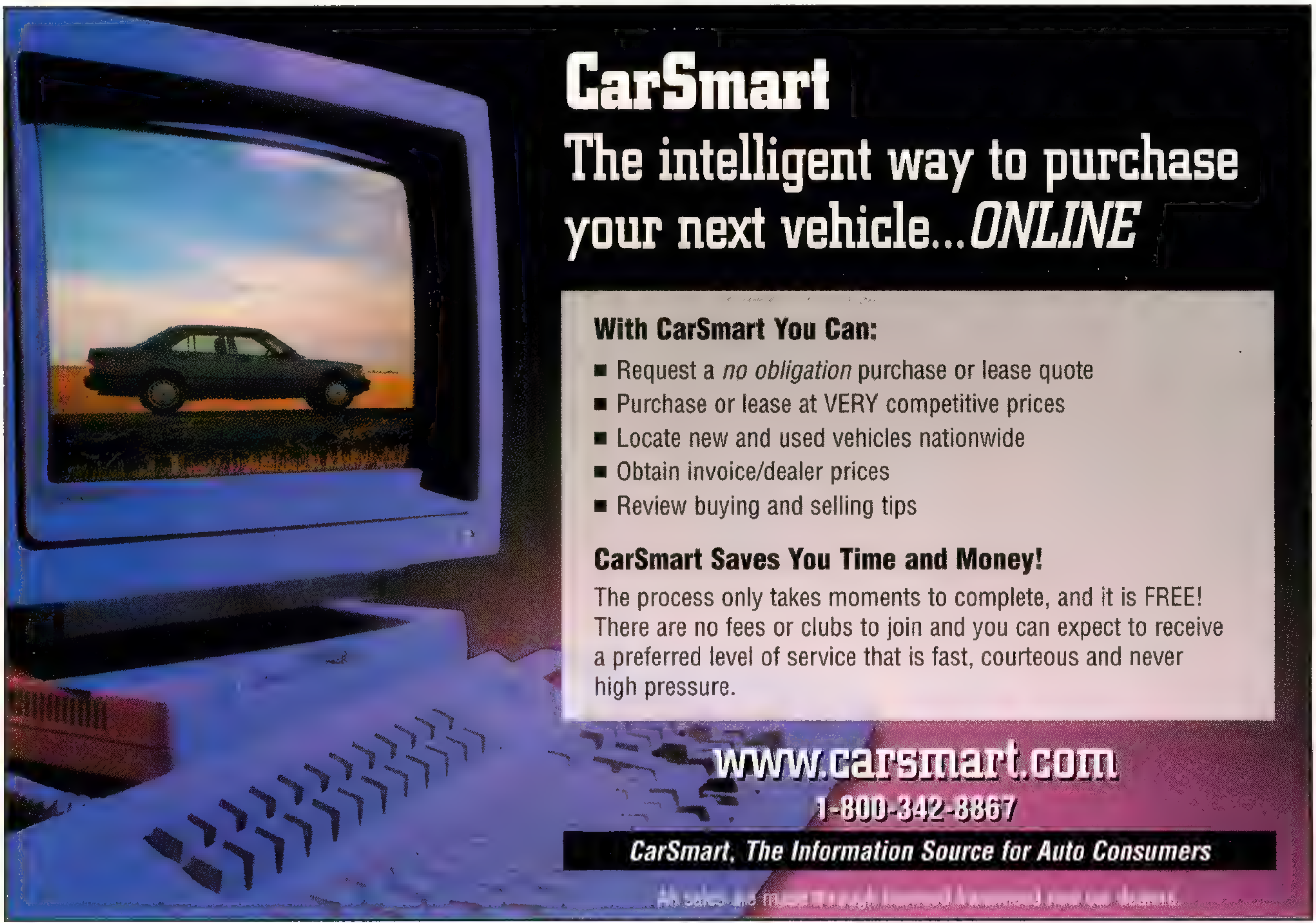
THESE ARE EXAMPLES OF A REVOLUTION TAKING PLACE IN COMMUNICATIONS TECHNOLOGY.

I've thought of developing a computer telephony application that initiates a call back to everyone who left a message on my voice mail to let them know that "your call is very important to me and I will try to get back to you." I've also thought of an automatic e-mail application back that says, "Jeff now has 4,212 messages in his inbox. At the rate he has been replying to his e-mail, you will receive a response in 19 days or less."

Products like the PocketNet phone and the next generation of wireless beepers and related devices are important technologies because they'll allow us to close the loop. For example, if I set up a "smart" filter on my regular e-mail account, I can selectively forward certain messages to my PocketNet.

While this is not yet a perfect system, these are examples of a revolution taking place in technology that will allow people to more easily conduct effective two-way asynchronous communication. ■

Jeff Pulver (jeff@pulver.com) publishes The Pulver Report and is author of Internet Telephone Toolkit *(John Wiley & Sons).*



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THE MAGAZINE FOR INTERNET USERS

By Reaz Hoque

BREWING JAVASCRIPT

Get the full kick of interactive HTML without the overhead. Bottle your own at home, using free materials. Here's how to get started.

Want to make your Web pages come alive without having to buy an expensive authoring package or learn an industrial-strength programming language? JavaScript—introduced by Netscape with the release of Navigator 2.0—may be exactly the tool you're looking for. This cost-free, easy-to-learn scripting language can turn a small investment of your time and effort into big dividends in Web site interest, interactivity, and efficiency. Want to tailor the appearance or content of your home page to suit the time of day? Register your visitors and greet them with personalized messages? Control the behavior of plug-in players or Java applets? Serve data from your custom database? You can do all of these things and much more with JavaScript.

There are many similarities between JavaScript and the Java programming language—for one, the JavaScript command set is a subset of Java's—but for a number of reasons, JavaScript is far simpler to use. With Java, for example, you need a separate tool called a compiler to transform source code into executable programs, and once it's compiled the user cannot view or change the code. With JavaScript, on the other hand, the source code (the script) is embedded in the HTML page and is "interpreted" by an engine running in the browser. This means that in most cases you don't need to compile the script, so JavaScript code can be viewed and edited easily. Better yet, there's one important thing that JavaScript can do that Java can't: It can manipulate the content and appearance of the Web page itself.

A CLOSER LOOK

The following examples illustrate some of the almost limitless possibilities of working with JavaScript.

Managing Forms. Before the advent of JavaScript, the HTML forms used to collect information from Web site visitors relied on the Common Gateway Interface (CGI). In cases where a form was submitted with an invalid input, a user had to wait for the server to return the information about the problem. JavaScript, however, can monitor forms input in real time. The forms designer can use JavaScript to check the contents of each form field as the user enters it, prompting with error messages and suggestions when necessary. Moreover, JavaScript can handle the actual submission of the data via e-mail using a simple "mailto" command.

Managing Web Page Appearance. JavaScript can change a Web page's background color, text color, or link colors according to a user's preference. Further, based on the PC's internal clock, a script can automatically modify any of those Web page attributes. For example, between midnight and 6:00 a.m., you could post a banner that said, say, "Great to see you, but shouldn't you be in bed?"

Storing and Retrieving Information. Personalizing interactions with visitors can build user loyalty. With JavaScript, it's easy to set up a log-in routine that asks new visitors to type in their name. The script can then store this information in an entity called a "cookie," from which other scripts can retrieve it. With the info stored in this way, you can then easily craft messages along the lines of "Welcome back Mary! We haven't seen you since [date]" each time the visitor returns. This functionality also can be used to create more sophisticated applications like a shopping cart.

Displaying Dynamic Data. In conjunction with tools called LiveWire and LiveWire Pro, JavaScript can be used to connect with databases. This means that if your database is compatible with LiveWire or LiveWire Pro, you can display its contents—your product catalog, perhaps—over the Internet; pretty potent functionality for a scripting language! (For more information on LiveWire and LiveWire Pro, navigate to **http://home.netscape.com/comprod/server_central/product/livewire/**.)

Communicating with Plug-ins and Applets. The latest version of JavaScript now lets plug-ins and Java applets communicate with each other. LiveConnect, as this feature is known, uses JavaScript like glue to join these key technologies. You could, for example, use JavaScript to grab your visitor's name from a browser cookie and insert it in a Java marquee applet to create a scrolling message like "Hi Mary! Nice to see you again." Or you can have JavaScript manipulate a plug-in—say the one that displays Envoy documents in Netscape Navigator—to let you zoom in on a specific part of the document or create a search option for the document. The LiveConnect functionality is a dream come true for many developers. (For more information

WHERE DO I GO FROM HERE?

The following sites provide a rich set of resources for those beginning to work with JavaScript. They contain examples, tutorials, and other reference materials.

http://home.netscape.com: Netscape's homepage. Here, you can get information on LiveWire and LiveWire Pro as well as Netscape Navigator browser.

http://home.netscape.com/eng/mozilla/3.0/handbook/javascript: All the syntax information for version 1.1 of JavaScript can be found here. This is an essential and a great place to start if you are new to this language.

http://rhoque.com/book: This site has a lot of examples from the upcoming JavaScript book titled *Practical JavaScript Programming* by MIS Press.

http://www.tradepub.com/javascript: JavaScript Resources A 2 Z is the ultimate JavaScript resource center where you can find examples, tutorials, and news about JavaScript.

A JAVASCRIPT FRAMEWORK

```
<HTML>
<TITLE>JavaScript Test (1)</TITLE>
<HEAD>
<script language=“JavaScript”>
<!--Hide Script from non-supportive browser
// Your Code Goes Here
// Done Hiding-->
</script>
</HEAD>
<BODY>
This is a test...
</BODY>
</HTML>
```

Example 1

on LiveConnect, navigate to **http://home.netscape.com/comprod/products/navigator/version_3.0/building_blocks/liveconnect**.)

GETTING STARTED

One great thing about JavaScript is there's nothing to buy. All you need is a text editor and a JavaScript-aware browser. (Note that although Microsoft Internet Explorer 3.0 contains support for JavaScript, it is only for Microsoft's proprietary version, JScript; the full syntax of JavaScript is supported only by Netscape Navigator 3. For basic information on JavaScript 1.1, consult Netscape's JavaScript handbook at **http://home.netscape.com/eng/mozilla/3.0/handbook/javascript**.)

OK, we're ready to create scripts—almost. Before we can start building in earnest, we need to understand JavaScript's fundamental syntax. Take a look at Example 1, above.

You should take special note of several details in the listing. First, the script segment is placed within the <HEAD>...</HEAD> tag. You can also put these tags inside <BODY> tags, but if you're planning for a script to be called before the HTML document gets loaded, as you might in many circumstances, you should place the script segment inside the <HEAD>...</HEAD> tag.

Next, for your browser to understand JavaScript syntax, you'll need to put the code segment within the <Script>...</Script> tag. Use of the “language=JavaScript” identifier after “script” is optional, but it's a good idea to include it, since Internet Explorer 3.0 also supports VBScript.

Third—and most important—you should always place the script proper within the <!-- ... //--> tag; otherwise, browsers that don't understand JavaScript will display the code right on the HTML page—to the bewilderment of your Web site visitors.

Now we'll add some text to our script framework, turning it into a simple working script that prints a sentence on your Web page. Example 2, right, shows both the listing and the script result. Note that when you want JavaScript to write text on your HTML page, you must define the script within the <BODY>...</BODY> tag.

JavaScript has some built-in *objects* with their own *methods* and *properties*. Some of the most frequently used objects are date, document, and form. In Example 2, we used the **document** object and its **write()** method to write “Hello World!” on the page. (The words *object*, *method*, and *property* all have special meanings in a programming context: An object is a language element; its *methods* are the things it can do; its *properties* are its characteristics. To use an analogy, a car (object) has methods for moving forward and backward and stopping (the forward, reverse, and brake methods) and properties, such as color and weight. In JavaScript, the word “function” often has the same meaning as “method” does in relation to objects)

Before we go on to some more realistic and useful examples—all of which you can easily use in your Web pages, by the way—we need to note a few more important points about JavaScript. Knowing about these up front may save you some headaches.

- JavaScript syntax is case-sensitive. If you get a JavaScript error, check to see if you made an uppercase/lowercase error. I recommend always using lowercase variable and function names to keep things simple.
- With JavaScript, you won't get an error message if you don't put a semicolon “;” after each line, as you would with C/C++. I recommend using the semicolon, however, as good programming practice.
- To define a variable, you do not need to use the reserved word “var” or “int” (although, again, this is recommended. A variable—whether it is a floating-point number or a string—can be defined simply by entering the variable name.)
- If you get a JavaScript error message, the line number cited for the error is counted from the first line of that HTML page.
- Not only can you call JavaScript functions from other functions, you can also call functions from “event handlers” such as **onMouseOver**, **onClick**, etc.
- When adding comments to your script, use // before a single line or /* ...*/ for multiple lines. For example:

```
// This is a single-line comment
/* This is a multiple-line
Comment */
```

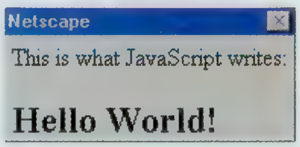
- When you have a page that includes JavaScript make sure to define the HEIGHT and WIDTH of any images on that page. For example:

```
<img src="myfile.gif" height=50 width=400>
```

MAKING A JAVA SCRIPT TEST

```
<HTML>
<TITLE>JavaScript Test (2)</TITLE>
<HEAD></HEAD>
<BODY>
This is what JavaScript writes:<br>
<script>
document.write("<h2>Hello World!</h2>");
</script>
</BODY>
</HTML>
```

THE RESULT:



This is what JavaScript writes:

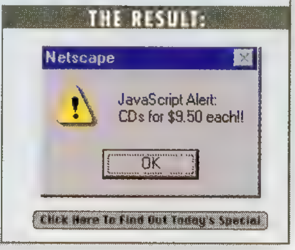
Hello World!

Example 2

DISPLAYING SPECIAL MESSAGES

```
 <HTML>
 <TITLE> Displaying a message</TITLE>
 <HEAD></HEAD>
 <BODY>
 <form>
<input type=“button” value=“Click Here For Today’s Special”
onClick= ‘alert(“CDs for $9.50 each!!”)’>
 </form>
 </BODY>
 </HTML>
```

THE RESULT:



JavaScript Alert:
CDs for $9.50 each!!

Example 3

JavaScript seems to have problems when this instruction is not followed, especially when opening pop-up windows.

- When creating forms that will work with JavaScript, make sure you use lowercase letters for defining the form and its elements. For example:

```
<form name=“myForm1”>
<input type=“button” value=“Click Here” onClick=“JavaScriptFunction”>

</form>
```

- Much of the JavaScript syntax (especially that of version 1.1) is not fully supported by Microsoft Internet Explorer 3.0, which supports substantially fewer objects than does Navigator 3.0. To find out which objects are supported by Netscape Navigator 3.0, refer to **http://home.netscape.com/eng/mozilla3.0/handbook/javascript**; for the corresponding information on Microsoft Internet Explorer, check out: **http://www.microsoft.com/jscript**. For security reasons, client-side JavaScript cannot write to or read from a file except for saving limited information using cookies.

EASY SCRIPTS

Now, we'll move on to some script examples that, although still fairly simple, are nonetheless practical, real-world applications. As mentioned, you can copy these scripts into your own pages and modify them in any way you like.

Displaying Messages. Suppose you're selling products from your Web page and you want to call attention to the special sales you have from time to time. A button that will display a special message might be just the thing. Take a look at Example 3, above.

In this script, we first created a button with an appropriate label. When a user clicks the button, the **onClick** event handler calls the **alert()** method, which displays the text describing the special of the day. Note that we have to put the actual text message—CDs for $9.50 each!!—in double quotes inside the **alert()** method and the whole argument—**'alert("CDs for $9.50 each!!")'**—inside single quotes.

Playing Music or Sounds. You might want to play music or other sounds from your page. It's easy to do with JavaScript. You can even play different sound files depending on what time your visitor visits your page. Check out the listing in Example 4, below.

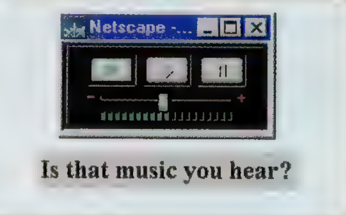
First we call the **play_music()** function from the <BODY> tag using the **onLoad** event handler. In this function, we define a new date object using the key word "new." Since the **date** object is a predefined object in JavaScript, we can use its methods such as **getDay()** or **getMinutes()**. In the example, we use the **getMinutes()** method with "if . . . else" statements. We say that if the time is between 0 and 20 minutes then play Music1.wav file, otherwise if the time is 21-40 minutes then play Music2.wav file, otherwise play Music3.wav file. To actually play the file, we set the files to the "location" property of the window object. ■

Reaz Hoque (rhoque@rhoque.com) is a software developer, Web designer, and author of the upcoming Practical JavaScript Programming *(MIS Press).*

PLAYING SOUNDS DEPENDING ON THE TIME

```
<HTML>
<TITLE> Playing Sound depending on the time</TITLE>
<HEAD>
<script language=“JavaScript”>
<!--Hide Script from non-supportive browser
function play_music(){
var my_time= new Date();
if ((my_time.getMinutes()>=0) && (my_time.getMinutes()<=20))
window.location=“Music1.wav”;
else if ((my_time.getMinutes()>=21) && (my_time.getMinutes()<=40))
window.location=“Music2.wav”;
else if ((my_time.getMinutes()>=41) && (my_time.getMinutes()<=60))
window.location=“Music3.wav”;
}
// Done Hiding-->
</script>
</HEAD>
<BODY onLoad=“play_music()”>
<h2>Is that music you hear?</h2>
</BODY>
</HTML>
```

THE RESULT:



Is that music you hear?

Example 4

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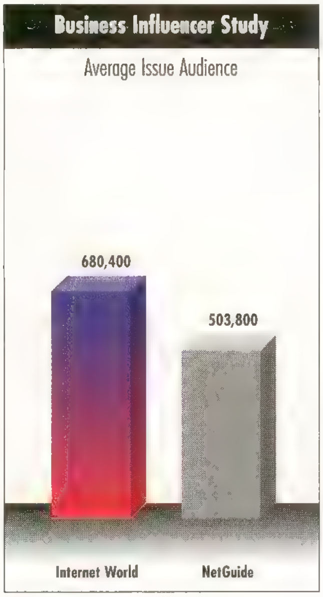

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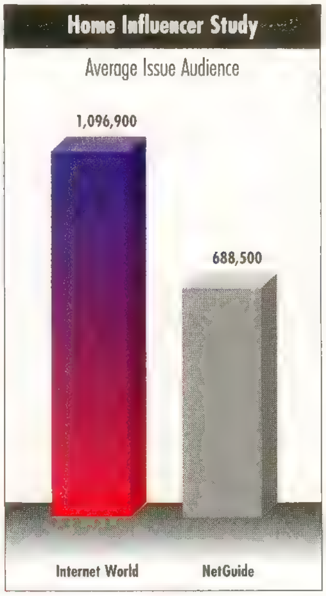

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ANDREW KANTOR REBECCA ROHAN JIM SABO STEPHEN SATCHELL

Internet talk down and dirty
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Privacy in the Internet Age

Senior editor Andrew Kantor and some Net journalists and pundits debate the question: Does having the Internet mean losing our privacy?

Once upon a time, being forced to have a number on your house was considered an invasion of privacy. Our tolerance for people knowing about us has certainly gone up since then, but every day it seems there's a new way for people to learn some intimate detail about our lives—and possibly to use it against us.

Enter the Internet, which for the first time makes public information truly public, from names and addresses to driving records. What will the Net effect of this perceived loss of privacy be? Will laws be passed? Or, as David Brin hypothesized in his novel *Earth*, will privacy become a thing of the past?

JIM SABO: Laws governing privacy will certainly be passed, and if the past is any indication, they'll probably be the wrong laws. Much of the information that's being placed on the Web is already public, but it used to be so difficult to get that it was essentially private. So do we laud this new freeing of information as a good thing, or do we scramble to take away what was once free?

ANDREW KANTOR: Well that's the question. What's the answer?

SABO: Personally, I think that it's great. I'd like to see more of this information made available. If the phone company has an accurate phone number for someone, why should I only have access to a two-year-old database online? Pass laws to stop mass mailing and junk e-mailing, not ones that give people better access to information they can get to already.

REBECCA ROHAN: If Joe Blow's phone number is unlisted, it probably won't wind up on the Internet unless he makes somebody mad. And then he can probably sue them.

Yes, the Internet amplifies things that are already happening, but maybe people will have learned to deal with that after going all to pieces over porn and bomb recipes on the Net. I think most people will find it more convenient than inconvenient that there is easy access to public information. I think the argument is about convenience, not privacy, after all.

KANTOR: It's not just a convenience thing. One of the reasons people are paranoid about this is that now it's more than a distrust of government; it's a realization that so many people seem to know so much about us, more than just knowing your Social Security number. Services like WiseWire and Firefly use the number-crunching power of computers to develop a profile of you based on your accumulated preferences. And with the supermarket-scanner data that companies like IRI and Nielsen collect, someone else could get to know you pretty well—imagine a stranger coming up to you and telling you what kind of car you drive, your favorite color, and what brand of ice cream you like. Now imagine thousands of people doing that.

STEPHEN SATCHELL: It wasn't that long ago that only governments and the largest corporations had the resources to make sense of that widely gathered data. Today, the capability to process large quantities of data is within reach of even small businesses and not a few individuals. Laws only stop the honest and the casually dishonest. That's one thing the "drug wars" have taught us.

The underlying issue of "privacy" is to be able to control the information other people have about us. For example, Social Security numbers wouldn't be a big deal if they weren't also used by banks to verify customer identities and by the IRS as your tax ID number.

KANTOR: But they *are* a big deal because of that, and, in part, because the Net makes it easier to take that Social Security number "key" and stick it into as many locks as possible. Suddenly the illusion that we have some control of the information about us has been shattered. We really have none.

SABO: The real problem isn't the controlling of the information, but fighting the misconception that having all this information readily available is going to cause a breach of privacy. Look at cookies: They're a great solution to the problem of maintaining information about a user from visit to visit, but I've seen dozens of letters from users who had no idea what a cookie was, complaining that their privacy was being breached. The site owners probably could have figured out who that person was in some way that didn't use a cookie and the person would have never known about it. But because someone planted the seed that these things were bad, users wrote in to complain.

The Net makes it easier to get to information and may reveal things that people previously didn't know was publically available, but it's still easier to find out really detailed information about someone through bribes or detective work.

KANTOR: So the information is no more public than it was before the Internet; it's just easier to get. But when it's that much

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easier to obtain, the difference is more that just one of degree. It becomes a difference in *kind*. I submit that having this information so easily available (regardless of whether a dedicated person could have found it before) is more of a threat to people's privacy.

Until now, the difficulty in finding information meant that only someone with a lot of money or a lot of time—and charisma—could get it by visiting courthouses, filing motions, or what have you. That's no longer true.

ROHAN: Hurrah! I haven't seen court records online, but I wish there were. Just as you say, Andrew, the records have been available to people who have the time and money to visit the courthouses or hire a detective to visit for them. And what's wrong with looking for public files on someone with whom you're considering doing business, or on a person who will have a lot of interaction with your children? The records are public—let the whole public have them, not just the wealthy public.

WHAT'S WRONG WITH LOOKING FOR PUBLIC FILES ON SOMEONE WITH WHOM YOU'RE CONSIDERING DOING BUSINESS?

SATCHELL: But, but, but . . . how much of that information on you and me is *accurate*? Try getting your credit record sometime. Mine was an interesting work of fiction, indeed. Earlier this year some investment firms got the strange notion that I had $100,000 to invest. ("Freelance writer" and "$100K" in the same sentence is an oxymoron.)

Part of the information problem isn't the existence of data, but the inability for each person to verify the accuracy of that data. Bad data can be worse than no data at all; one of my relatives was classified as dead by the Social Security administration and it took *years* to get that straightened out and start the checks coming again.

SABO: Agreed. Andrew began by mentioning the online phone books. Only one of the three big white pages has the address where I've lived for the last two years. Two months ago they all had my old address.

I disagree that the new ease of access, or the discovery that something you thought was private isn't, is a violation of privacy. Ignorance is not exemption under law, so why should it be any different in privacy? I've yet to see one site that refused to take down data that you didn't want displayed. And places like Firefly, which might be able to tell you interesting conclusions that they've drawn about you, profess fanatically that they won't give away that information.

ROHAN: Yes, Satch, it's frustrating to see inaccurate information everywhere—in credit records, in testimony before the state legislature, or on the evening news—but *ex abusu non arguitur in usum*: the abuse of a thing is no argument against its use. The more access people have to their own records, the more opportunity to find and correct inaccuracies. That's empowering. And yes, bad data *can* be worse than no data, but the way to fight wrong information is with right information, not less information.

KANTOR: That's a good argument when dealing with Holocaust deniers, but I don't think it applies to credit bureaus like TRW and other so-called "reputable" sources. In that case, your *correct* information will never carry as much weight as their *official* information. People are learning to expect bad data from the Internet; but when that information is from someone you trust—be it the Mayo Clinic, TRW, or the Postal Service—you expect that they've done their research and will get it right.

Back to the privacy issue. Assuming the information about you is correct, how does having it more easily accessible pose more of a threat? (That is, in anything other than a it's-creepy-that-someone-knows-this-about-me sense?)

SATCHELL: Depends on who you are. If you are an average person, the threat to you is minimal because you don't represent a significant threat to others, and that makes other people's interest in you benign. If you become a threat to others—because of effective political activism, for example, or because you have found a way to get 300 miles to the gallon of gas—that information eases the task of neutralizing you.

At the limit, you have two choices: Keep a low profile or become what the Max Headroom writers called a "blank"—someone not known to the system at all.

SABO: The threat is that someone who might not have gone out of their way to find out something about you might now be able to find this information and act on it, so some of the layers may have been made simpler. I'd argue that if they couldn't be bothered to go to the library to get your number, the fact that they got it online probably doesn't make them any more dangerous, but there are obviously going to be exceptions to this rule.

I guess the real test of this is going to be seeing how many of us get stalked after this column comes out.

KANTOR: Nail on the head, Jim. The complexity of conducting a search for this info in the pre-Internet days acted as a filter against most of the people who would use it nefariously. You had to be fairly intelligent (and have the time and inclination) to dig this stuff up. Now any low-IQ type can find it—and you—in a matter of hours.

So give me your one-sentence answers: Is information about people too easy to get these days? Or are we overreacting to someone knowing what brand of soap we use?

SABO: Hey, I've always had chronic dry skin. If someone knowing I use Dove is the price I have to pay for access to all the other useful information out there, I'll pay it and consider it a bargain.

ROHAN: I want to see more substantial public information online—criminal records, successful malpractice lawsuits against physicians, reprimands for abuse by law enforcement, etc.

SATCHELL: Information not under the control of the individual is too easy to get; what a person chooses to publish is his or her own funeral.

KANTOR: I'm with Rebecca. There's no going back, and there's no hiding the information. So let everyone have it. ■

Comments? Send them to **kgroup@iw.com**. Next month: Online shopping—What will it take to bring it to the mainstream?

Andrew Kantor is senior editor of Internet World. *Rebecca Rohan is a Seattle-based writer and contributing editor to* I-Way *magazine. Jim Sabo is a freelance writer and chief programmer for Ticketmaster Online. Stephen Satchell is a longtime Internet journalist and ARPAnet veteran since 1971.*

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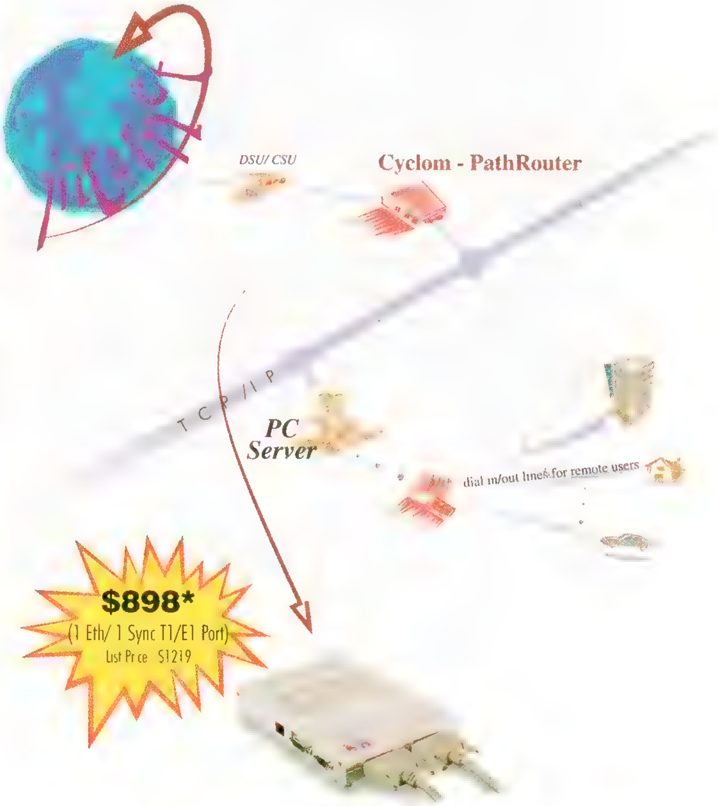

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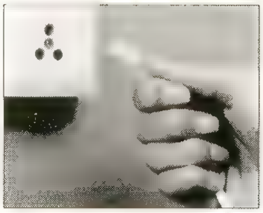

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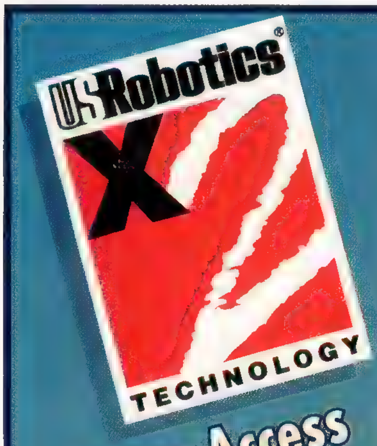

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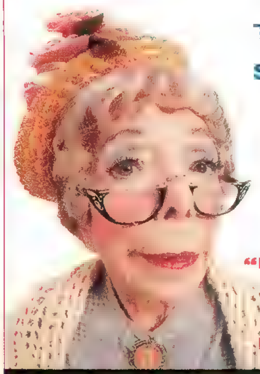

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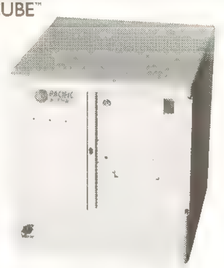

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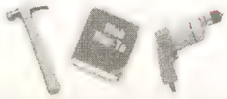

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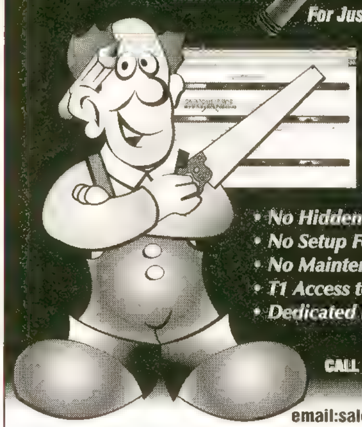

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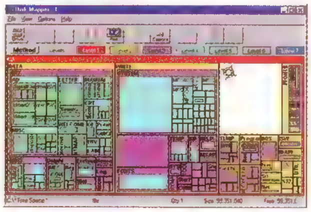

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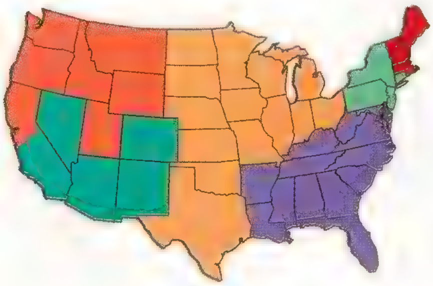

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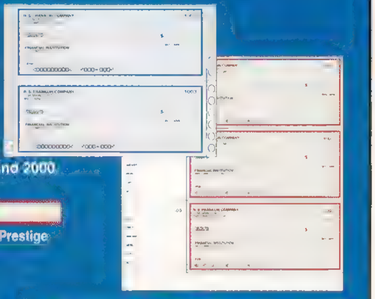

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ADVERTISER	READER SERVICE #	PAGE #
A Foreign Affair	72	123
ACS/Compro	8	37
Apex Global Information Services	184	124
AIN	54	102
Akorn Access	138	120
American Data Technology	166	123
Anawave	12	43
Artbeats	112	121
Auto-By-Tel	32	39
Backweb Technology	52	14
Barnes & Noble	10	63
Berkeley Software (BSDI)	82	11
Best Internet Communication	18	83
Bestware Inc.	118	121
Canyon Interactive	61	99
Capella Worldwide	116	115
Career Magazine	176	124
Chemical Abstract Services	16	23
Cinecom Inc.	42	77
Classmates	110	117
Clockwork Internet	120	121
Computer Business Service	128	121
Cyclades	56	112
Delta Point	6	9
Designer Checks	178	125
Designer's Direct	182	125
Digiscape Communications	80	118
Folio Corp	50	71
Foreign Relations	168	122
Haystack Labs	68	64
Hiway Technology	2	111
Homecom	192	109
Hypercon	132	114
IW Labs		103
IAMAWASP	170	122
Ideal Dial	126	116
IDT Internet	58	112
Infoaccess	30	41
Infomagic	94	114
Innovative Software	86	118
Intelliquest		107
Interactive Media Corp.	142	119
Internet Business Solutions	124	119
Internet Communications	136	118

ADVERTISER	READER SERVICE #	PAGE #
Internet Direct	28	21
Internet Direct Canada	114	120
Internet Enterprise Center	144	116
Internet Research	20	113
Internet Web Services Corp.	196	91
Internet Shopping Network	22	17
I.W. 3-Show '97	24	93
I.W. International '97	4	4
Johnnie Walker	14	CVR6
Level 5 Research	130	121
Luckman Interactive	34, 36	27, 29
Luckman Interactive	40, 38	31,33
Meckler "Family"		85
Media Synergy	66	70
Micro Logic Corp.		120
Micron Networking	150	115
Microsoft		CVR2-1
Netbots	134	116
Netbox	188	120
Netheads	164	122
Net Names USA	106	119
Net Radio	42	87
Net Win Ltd.	156	122
New Hampshire College	180	125
On The Net	98	117
Ounique, Inc.	190	123
Pacific Internet	148	117
Pacific Investment Realtors	152	123
Pick Internet Connection	140	118
Public Eye	158	122
Qualcomm		5
Quotesmith	48	19
Rent Net	100	114
Robert Half Consulting	64	12
Sea Change	108, 90	114, 119
Single Search	162	122
SoftQuad	46	79
Solar Systems	174	125
Solunet	76	116
Sony Electronics Inc.	102	24-25
Spring Internet World '97	122	88-89
Superhighway Sunglass	88	118
Synergy Software	104	117
SyQuest	194	CVR5
Teleadapt	78	115
Top Choice Systems	160	122
True Love Links	154	122
UUNET Technologies	92	7
U.S. Robotics	26, 62	34-35, 56-57
Value Web	74	117
Walden University	60	64
Wave Interactive	70	4
Web 2010	96	116
White Pine Software	44	13

To get more information on the products advertised in Internet World, circle the corresponding number on the reader service card. This index is provided as an additional service by the publisher, who assumes no liability for errors or omissions.

EDITORIAL PRODUCT INDEX

PRODUCT	COMPANY	PAGE	CONTACT
ActionLine 1.1	Interactive Media Corp.	73, 74, 75, 86	http://www.imcinfo.com
Activator Pro	Network Oriented Software	73, 75-76, 86	http://www.noware.com
Active Worlds	Worlds Inc.	49	http://www.worlds.net
ActiveX	Microsoft Corp.	49, 67, 68, 69	http://www.microsoft.com
AppletAce 1.0	Macromedia Inc.	73, 76, 86	http://www.macromedia.com
Astound WebMotion 1.0	Astound Inc.	73, 74, 80-81, 86	http://www.astound.com
AuditTrack	E.G. Software	42	http://www.egsoftware.com
The Castanet Tuner	Marimba Inc.	49	http://www.marimba.com
Centri Firewall 3.1	Global Internet	22	http://www.globalinternet.com
Cold Fusion 2.0	Allaire Corp.	22	http://www.allaire.com
CORBA	Object Management Group	68, 69, 70	http://www.omg.org
DCOM	Microsoft Corp.	68, 69, 70	http://www.microsoft.com
Email Reader	Millennia Software	20	http://www.msw.com
Enhanced CU-SeeMe	White Pine Software	48	http://www.cu-seeme.com
Enliven Producer	Narrative Communications	49	http://www.enliven.com
Enliven Server	Narrative Communications	49	http://www.enliven.com
Enliven Viewer	Narrative Communications	49	http://www.enliven.com
Gamma	Worlds Inc.	49	http://www.worlds.net
HP 200LX palmtop	Wynd Communications Corp.	102	http://www.wynd.com
InterJet	Whistle Communications	22	http://www.whistle.com
Internet Explorer	Microsoft Corp.	47, 48, 49, 70, 104	http://www.microsoft.com
Jamba 1.125	Aimtech Corp.	73, 74, 81-82, 86	http://www.aimtech.com
Joe	Sun Microsystems	69	http://www.sun.com
KEYview Pro 5.1	FTP Software	22	http://www.ftp.com
Liquid Motion Pro	Dimension X Inc.	73, 74, 82-83, 86	http://www.dimensionx.com
LiveConnect	Netscape	70	http://www.netscape.com
Market Focus 2	Intersé	42	http://www.interse.com
Microsoft Active Desktop	Microsoft Corp.	49	http://www.microsoft.com
Mojo 2.0	Penumbra Software	73, 74, 84-86	http://www.penumbrasoftware.com
net.Analysis Pro 2.0	net.Genesis	42	http://www.netgen.com
NetLine	I/Pro	42	http://www.ipro.com
NetResults	Innotech Multimedia Corp.	22	http://www.innotechcd.com
Netscape Media Server 1.0	Netscape	47	http://www.netscape.com
Netscape Navigator	Netscape	49, 70, 102, 104	http://www.netscape.com
Netscape Communicator	Netscape	47, 96, 98	http://www.netscape.com
OrbixWeb	Iona Technologies	69	http://www.iona.com
The Palace	The Palace	49	http://www.thepalace.com
PocketNet phone	AT&T Wireless Data Division	100-102	http://www.airdata.com
QuickTime Virtual Reality	Apple	46	http://www.apple.com
RealAudio Player	Progresssive Networks	46, 47-48, 73	http://www.realaudio.com
Remote Message Invocation	JavaSoft	69	http://www.javasoft.com
Rooms 3.0	Ichat	22	http://www.ichat.com
Shockwave	Macromedia	48, 73, 78	http://www.macromedia.com
SQA LoadTest	SQA	42	http://www.sqa.com
StreamWorks	Xing Technologies	46, 48	http://www.xingtech.com
Streaming Media Viewer	Intel	48	http://www.intel.com
VDOLive	VDOnet	46, 47	http://www.vdo.net
VisiBroker for Java	Visigenic	69	http://www.visigenic.com
VivoActive	Vivo Software	48	http://www.vivo.com
Vosaic player	Vosaic	47	http://www.vosaic.com
WebLoad	RadView Software Ltd.	42	http://www.radview.com

LogOut

BY ANDREW KANTOR

Geek Speak

Every culture has its slang, and the Internet is no different. Currently making the rounds is a list of high-tech euphemisms. Our favorites:

Link Rot: The process by which links on a Web page become obsolete as the sites to which they're connected change location or die.

Plug-and-Play: A new hire who doesn't need any training. Usage: "The new guy, John, is great. He's totally plug-and-play."

CGI Joe: A hard-core CGI script programmer with all the social skills and charisma of a plastic action figure.

404: Someone who's clueless. From the World Wide Web message "404, URL Not Found" meaning that the document you've tried to access can't be located. Usage: "Don't bother asking him—he's 404, man."

Client-Server Action: Geek euphemism for having sex. Usage: "I went to the Oracle party the other night hoping for some client-server action."

Nyetscape: Nickname for AOL's less-than-full-featured Web browser.

Dead Tree Edition: The paper version of a publication. Usage: "I saw it in the dead tree edition of the *San Francisco Chronicle*."

Egosurfing: Scanning the Net, databases, print media, or research papers looking for mention of your name.

Bookmark: To take note of a person for future reference. Usage: "I bookmarked him after seeing his cool demo at Siggraph."

Alpha Geek: The most knowledgeable, technically proficient person in an office or workgroup. Usage: "Ask Larry, he's the alpha geek around here."

Crapplet: A badly written or profoundly useless Java applet. Usage: "I just wasted 30 minutes downloading this stinkin' crapplet!"

Mouse Arrest: Being kicked off America Online for violating its terms of service.

BLAH, BLAH, BLAH

Touch Woody—The Internet Pecker

—Original ad copy for Panasonic's Internet-ready Japanese PC. The company had licensed Woody Woodpecker as the system's "Internet guide."

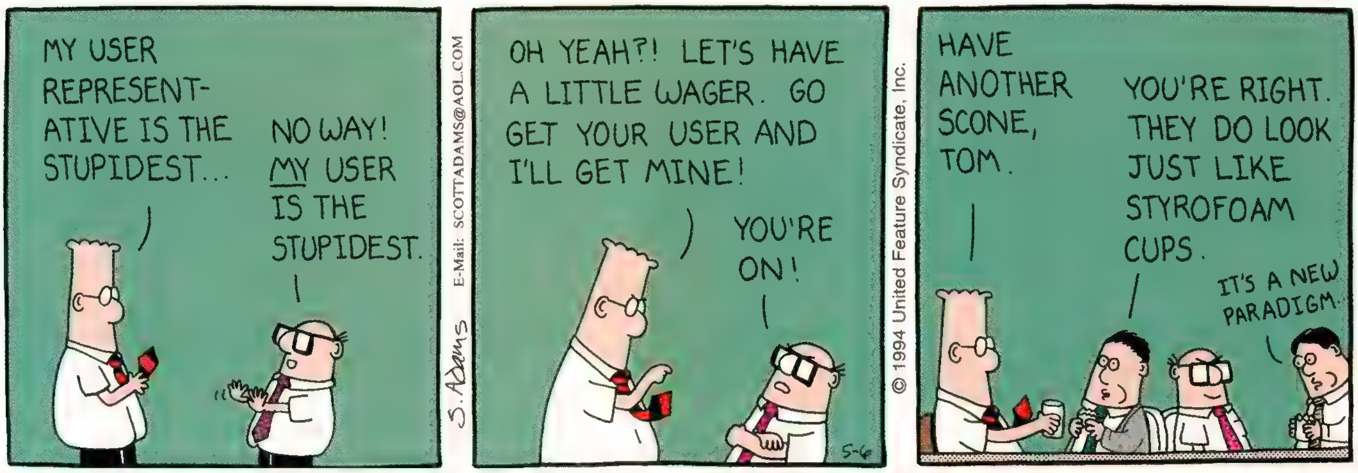
Prodigy Internet is the first service that allows you to be online and on the Internet at the same time.

—From Prodigy Internet's full-page ad in *The New York Times*.

I suppose I shouldn't complain too much; since, unlike "key-escrow" or "key-recovery," at least this term "czar" is an accurate and truthful description of the government's intentions.

—Jim Ray in a message commenting on the Clinton administration's appointment of an "Internet Czar."

Dilbert® By Scott Adams


MY USER REPRESENTATIVE IS THE STUPIDEST...
NO WAY! MY USER IS THE STUPIDEST.
S. Adams
E-Mail: SCOTTADAMS@AOL.COM
OH YEAH?! LET'S HAVE A LITTLE WAGER. GO GET YOUR USER AND I'LL GET MINE!
YOU'RE ON!
5-6
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HAVE ANOTHER SCONE, TOM.
YOU'RE RIGHT. THEY DO LOOK JUST LIKE STYROFOAM CUPS.
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Company ______________________________

City, State, Zip ______________________________

Country/Postal code(if not USA) ______________________________

Phone( ) ____________________ Fax( ) ____________________

E-mail ______________________________

Are you planning to purchase Internet-related products and services in the next 12 months?

Yes ☐01 No ☐02

Are you purchasing for use at your company, home, or both?

Company ☐03 Home ☐04 Both ☐05

What is the approximate value of all Internet-related expenditures, Including PCs, that you will be involved with at work, and at home?

	Work	Home		Work	Home
$1 million or more	☐06	☐10	$50K to $99K	☐14	☐19
$500K to $999K	☐07	☐11	$25K to $49K	☐15	☐20
$250K to $499K	☐08	☐12	$10K to $24K	☐16	☐21
$100K to $249K	☐09	☐13	$5K to $9K	☐17	☐22
			under $5K	☐18	☐23

Which of the following Products and Services are you Planning to Purchase?

- ☐24 PCs
- ☐25 Macs
- ☐26 Notebooks
- ☐27 Unix Systems
- ☐28 Servers
- ☐29 LAN/Network Equip.
- ☐30 Internet Access
- ☐31 Online Services
- ☐32 Consulting
- ☐33 Books/Videos
- ☐34 OS Software
- ☐35 Applications Software
- ☐36 Web Browsers
- ☐37 Security/Firewalls
- ☐38 Communications Soft.
- ☐39 Modems
- ☐40 Printers
- ☐41 Email Systems Soft.
- ☐42 Monitors
- ☐43 Memory/Storage

Would you like to receive information from Vendors about above Products and Services?

☐44 Yes ☐45 No

Advertisers

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140

141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280

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Where the Internet Means Business.℠

Welcome to the Most Important Event in the Internet Universe

The Louvre. Wimbledon. Carnegie Hall. **Internet World.**

What's the connection? There are hundreds of museums, stadiums, concert halls, and yes, even Internet conferences. Then there are those which have earned universal acclaim as simply being the ultimate stage for the world's best. The pinnacles where ambitions and dreams are fulfilled.

Now in its fourth year, Internet World has earned its distinction as **the definitive Internet industry meeting place.** Internet World is the event where more business and technical professionals have found **more Internet solutions than anywhere else on Earth.** It's where the largest Internet companies and the smallest start-ups come to give their best performances. And it's where the industry insiders come when they want to **feel the pulse of the Internet.**

You'll Find Even More Solutions in 1997

This spring in Los Angeles, Internet World provides you with more breadth and depth of industry information, more productivity solutions, more opportunities for revenue and profit, more insider views, and more experts with whom to network than ever before. New one-day workshops in conjunction with leaders like Intel and *The Red Herring* along with our new ISP World and VRML World conferences offer you a wider base of in-depth information from which to choose. These new conferences join an impressive roster of concentrated workshops from Sun Microsystems, Microsoft, *Adweek*, the Internet Stock Report, Apple Computer, plus a core program of 100 conference sessions, general and hands-on workshops — each led by acknowledged experts in their areas.

More than 15 Acres of Product Demonstration

The Internet World exhibit floor — **the largest Internet-dedicated exhibition in the world** comprising more than 600,000 square feet of products — offers you more demonstrations of more technology, with more industry contacts than you could amass in months of research.

Together, the Internet World Conference and Exhibition provide you with the world's most robust platform for realizing your Internet ambitions, whether for business applications or technical expertise.

Conference Hours

Monday, March 10	10:00 AM - 4:00 PM
Tuesday, March 11	10:00 AM - 4:00 PM
Wednesday, March 12	9:00 AM - 5:30 PM
Thursday, March 13	9:00 AM - 5:30 PM
Friday, March 14	9:00 AM - 4:45 PM

Exhibit Hall Hours

Wednesday, March 12	10:00 AM - 6:00 PM
Thursday, March 13	10:00 AM - 6:00 PM
Friday, March 14	10:00 AM - 4:00 PM

Table of Contents

CONTENTS **Page**

How to Use This Program 9

Overview

Conference and Exhibit Hall Hours 3
Keynote Presentations 5
Special Highlights 6-7
Exhibitor List 8
Internet World Magazine Industry Awards 14

Registration

Exhibit Hall Registration Form 7
Registration Information 46
Conference Registration Form 47

Workshops*

Workshops at-a-Glance 10-11
Sponsored Workshop Descriptions 15-25
General and Hands-on Workshop Descriptions 26-30

Sponsored Workshops*

Sun Microsystems Developer Day 15
Adweek Forum 16-17
NEW! VRML World Developer Day 18
NEW! *The Red Herring* Internet Entrepreneur Forum 19
Sun Microsystems Java Computing Day 20
NEW! ISP World 21
Apple Platform Developers Day 22
NEW! Intel Hybrid Applications Developer Day 23
Microsoft ActiveX Developer Day 24
Internet Daily Stock Report's Finance Friday 25

Conference Sessions

Conference Sessions at-a-Glance 12-13
Wednesday Session Descriptions 32-35
Thursday Session Descriptions 36-39
Friday Session Descriptions 40-43

Hotel and Travel Information

Hotel Reservation Form 44
Hotel List and Shuttle Bus Map 45
Airline and Travel Information 46
Internet World 1997 Show Dates 31

***Please note all workshops on Monday and Tuesday are being held at the Biltmore Hotel**

The World's Largest Internet, Intranet

How Spring Internet World '97 Will Benefit YOU

At Internet World, you have an unparalleled opportunity to explore the riches of the Internet universe. Whether you're just looking for a 'state of the industry' snapshot or wish to immerse yourself in a particular application or technology, the breadth and depth of the Spring Internet World '97 Conference and Exhibition allows you to plan a course ideally suited to your individual requirements.

As the industry meeting place, Spring Internet World '97 encompasses all segments of the Internet — the latest hardware and software, the proven applications and the esoteric. Regardless of your application or technical expertise, you'll come away with dozens of ideas from the conference and exhibition that will pay for your trip to Los Angeles many times over.

- **MIS and technical professionals** will find practical tips and tricks for solving challenges from bandwidth and security to intranet infrastructure and network servers.
- **Business professionals** will find practical information on Internet applications that increase efficiency and communications within your organization and provide new outlets for commerce and customer retention.
- **Developers** will find the ingredients needed to create and produce compelling and engaging presentations for Web content and online entertainment.
- **Marketing professionals** will find the tools and techniques to effectively employ the Internet as a one-to-one communications medium to reach consumers in ways that will change the very nature of advertising and promotional campaigns.
- **Investors and entrepreneurs** will learn more about the hottest new Net applications and technologies at the conference — then have an opportunity to see them in action on the show floor.

Between the sessions and workshops and more than 600 exhibiting companies, you'll gain a year's worth of insight in a matter of days!

What's NEW at Spring Internet World '97?

What isn't? Internet World is where the industry converges to unveil new products and services and learn about new technologies and applications. The Spring Internet World '97 Conference features a host of new sessions and workshops that will keep you abreast of these new developments.

In addition to learning from our hand-picked experts at the power sessions and workshops assembled for this conference, you will benefit from special day-long workshops sponsored by key companies with considerable influence in the Internet industry:

Combined, this vast curriculum comprises the industry's most comprehensive conference program. To help you navigate this extraordinary program, see "How to Use This Program" on page 9, then turn to the Program-at-a-Glance on pages 10-13 to plot your personal curriculum.

Sun microsystems
Developer Day
See page 15

ADWEEK
Forum
See pages 16-17

NEW!
VRML WORLD
Developer Day
See page 18

NEW!
RED HERRING
Internet Entrepreneur Forum
See page 19

Sun microsystems
Java Computing Day
See page 20

NEW!
ISP WORLD
See page 21

NEW!
Apple Platform Developers Day
See page 22

NEW!
intel
Hybrid Applications Developer Day
See page 23

Microsoft
ActiveX Developer Day
See page 24

INTERNET DAILY STOCK REPORT
Finance Friday
See page 25

Keep up to date with what's happening at Internet World 24 hours a day around the world! Visit us at http://events.iworld.com for program and exhibitor updates.

and Web Conference and Exhibition

Who Should Attend Spring Internet World?

If you're already an Internet insider, you know Internet World is the place to network with the best business and technical minds in the industry.

If you're new to the industry, or need to get practical information for taking your company's Internet presence to the next level, this is the place to be — over 200 expert speakers, more than 600 exhibiting companies and the largest gathering anywhere of Internet-savvy business and technical professionals with whom you can compare notes.

At Spring Internet World '97, you'll find the answers and solutions you need for creating and deploying Internet strategies for all of these business applications and more:

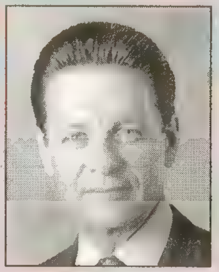
▸ Advertising ▸ Banking ▸ Broadcasting ▸ Customer Service ▸ Direct and Catalog Marketing ▸ E-commerce ▸ Educational Programming ▸ Entertainment ▸ Finance ▸ Interactive Gaming ▸ Intranet Development ▸ Marketing ▸ Media ▸ Multimedia ▸ Networking ▸ Publishing ▸ Research ▸ Software Development ▸ Telecommunications ▸ Venture Capital ▸ Virtual Reality Environments ▸ Webcasting ▸ Web Development ▸ Web Page Design ▸ Webzines

Pre-register for the sessions and workshops of your choice by February 14 and save $100! See page 47 for details.

Take a look at the Program-at-a-Glance on pages 10-13 to find the sessions and workshops best suited to your individual needs, then turn to the registration form on **page 47** to reserve your place at Spring Internet World '97.

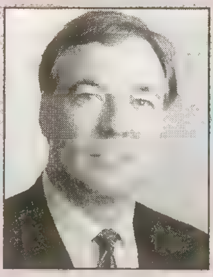
Keynote Presentations

Spring Internet World '97 offers you an insider's view from five of the most influential executives in the business. Each of these five keynote presentations is **free to all paid conference registrants.**



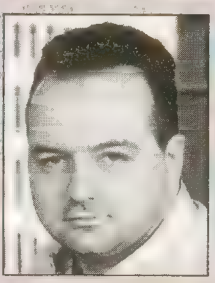
Wednesday, March 12
9:00 AM - 9:45 AM
Robert Palmer
Chairman, President/CEO of Digital Equipment Corporation
digital

Wednesday, March 12
1:15 PM - 2:00 PM
Dr. Gilbert F. Amelio
Chairman of the Board/CEO, Apple Computer, Inc.



Thursday, March 13
9:00 AM - 9:45 AM
Frank Gill
Executive Vice President/General Manager, Internet and Communications Group, Intel Corporation
intel

Thursday, March 13
1:15 PM - 2:00 PM
John R. Patrick
Vice President of Internet Technology, IBM Corporation
IBM



Friday, March 14
9:00 AM - 9:45 AM
Rob Glaser
Chairman/CEO, Progressive Networks
RealAudio
ProgressiveNetworks

Passport Pricing Saves You $1,674!

Save up to $1,674 when you register for the Internet World Passport. You'll have access to every session, every sponsored and general workshop, all in-hall special events, the exhibit hall, and receive the complete conference on CD-ROM — a $2,969 value!* You can do it all for only $1,295 when you purchase your Passport by February 14.

* *Hands-on Workshops and* Internet World *Magazine Industry Awards Luncheon not included.*

Reserve your seat for the 4th Annual *Internet World* Magazine Industry Awards

Friday, March 14 ▸ 12:00 PM - 1:45 PM

Join us for a special lunch presentation on Friday, March 14 as the winners of the Fourth Annual *Internet World* Magazine Industry Awards are announced, honoring the industry's most exceptional innovators and products. For further information on how to place nominations, turn to page 14.

Please note: Admission to the Internet World Industry Awards luncheon is $45.00 per person. Reserve early. Seats are limited. Be sure to check the Awards Luncheon box on your conference registration form. For group sales, call Debbie Barnes at 203-341-2871.

Everything You Need for Your Net Objectives

If it's got to do with the Internet, you'll find it at Internet World. No other event comes close to the sheer number of Internet-based products and services you'll find here.

Learn About It at the Conference...

Spring Internet World '97 combines the industry's most comprehensive conference program with the world's largest Internet exhibition to provide you with a coordinated, hands-on learning experience unparalleled at any other event.

Turn to the Conference Program-at-a-Glance on pages 10-13 to find the sessions and workshops that will help you reach your objectives and stay current with the fast pace of change.

See It In Action On the Exhibit Floor

Using the knowledge you've gained at the conference, you'll have ample time Wednesday through Friday to visit the exhibit hall and learn more about the products that make it all happen. This is your opportunity to really get into the nitty-gritty of developing a strong Internet presence. Experts at the conference provide you the information you need to set and fine-tune your objectives. Experts in the exhibit hall provide you the tools to realize them.

Bring a list of questions. Bring your specs. Experts at each exhibiting company will be happy to demonstrate how their products can help you achieve your objectives.

New Exhibitors Added Daily

Check for updates on iWORLD at
http://events.iworld.com

While at our iWORLD site, you'll also find the latest news from *Internet World*, *Web Week* and *Web Developer* magazines, plus Browser Watch, the LIST (a comprehensive guide to ISPs), the Internet Stock Report, Netday News and information on all other Mecklermedia events and publications.

Plan Ahead

There is so much to see, do and learn at Spring Internet World '97 you'll want more than just one day to take it all in. With a small city of Internet professionals expected, we advise you book your hotel and travel needs early. See pages 44-45 for a listing of official show hotels, prices and locations.

Network by IBM

IBM once again puts the "Net" into Internet World. From our e-mail center where you can check your office mail to Web access for conferees at our Internet World Cafe and journalists in the working press room to exhibitor's connections on the show floor, IBM is behind the scenes wherever you look at Spring Internet World '97.

Special Partner Pavilions Highlight Innovations from Developers

Microsoft ActiveX Pavilion

Microsoft

Microsoft's Active Platform has put Bill & Co. on the Internet map. Now with Internet Information Server 3.0, Microsoft takes aim at market leadership. Will they succeed? Find out for yourself by visiting the ActiveX Pavilion and evaluating the latest products created by ActiveX developers for Microsoft Windows™, Windows 95™ and NT users.

Netscape Partner Pavilion

Netscape has been the leader in Web interface technology since 1994 and with Netscape Communicator and Netscape's SuiteSpot Netscape continues to be the aggressive leader in Internet innovation and development. With Netscape now also firmly entrenched in the intranet market, you'll find dozens of Netscape development partners here offering a wide range of intranet productivity solutions.

Java Enterprise Applications Pavilion

JAVA

This pavilion features Java solutions that are ready for thin client or network centric deployment in commercial enterprises to assist corporate entities in building breakaway business strategies.

Register Early to Save Time and Money

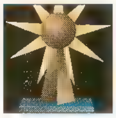
To register for the Exhibit Hall only, complete the form below. When you register by February 14, you'll save the $25.00 admission fee and receive your admission credentials by mail in advance of the event.

To register for the Conference please turn to page 47. Register by February 14 and save $100. Exhibits admission is included in your conference registration.

Exhibit Hall Hours
Wednesday, March 12
10:00 AM - 6:00 PM
Thursday, March 13
10:00 AM - 6:00 PM
Friday, March 14
10:00 AM - 4:00 PM

Special Highlights

The following events and services are included with your Conference admission.



Internet Bowl IV

Wednesday, March 12, 6:00 PM

The browser wars are nothing compared to Internet Bowl IV, where teams from industry giants face off to see who "really" knows the Net. Join *Internet World* editors Andrew Kantor and Eric Berlin as they challenge teams from these two operating environment giants to games of surfing skill and Internet trivia in the fourth installment of this most popular event.

Now serving hot java *(the liquid kind)* at the INTERNET WORLD Cafe

Open Wednesday, Thursday and Friday during exhibit hours.

Grab a cup o'joe, sit yourself down and take a well-deserved break at our INTERNET WORLD Cafe. It's the oasis to relax with your colleagues, check out our exhibitor's home pages, or catch up with all the latest industry news at iWORLD. Network connections by IBM. Open to conference attendees only.

Stay in Touch at the E-mail Center

Open Wednesday, Thursday and Friday during exhibit hours.

Need to check for a memo, confirmation or order while you're at Internet World? No problem — just stop by the Internet World E-mail Center.

Network connections by IBM. Open to all badgeholders

Cut here for free admission to exhibit hall. Conference attendees are automatically registered for the exhibit hall.

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World 97

FREE ADMISSION TO EXHIBIT HALL WITH THIS PASS

SAVE $25.00!

See all the exhibits at Spring Internet World '97 for free. Return this complimentary Exhibits Pass by February 14, 1997 and we'll send your badge in advance. After February 14, bring this form to the show.

TWO WAYS TO REGISTER FOR EXHIBITS

Mail to:
SIW97 Exhibits
1515 Champion Drive
Suite 100
Carrollton, TX 75006

Fax to:
972-620-3099
Attention: SIW97
Exhibits Dept.

1. MAILING INFORMATION ☐ Mr. ☐ Ms. ☐ Dr. PLEASE PRINT

First Name ____ Last Name ____

Title ____

Company ____

Street Address ____

City ____ State/Province ____ Zip/Postal Code ____ Country ____

E-mail ____

Phone ____ Fax ____

If you have already registered, please give this form to a colleague.

2. YOUR INDUSTRY (check one only):
- ☐ A. Computers/IT - Hardware/OEM
- ☐ B. Computers/IT - Integrator/Consulting/VAR
- ☐ C. Computers/IT - Software Development
- ☐ D. Consumer Electronics/Games
- ☐ E. Entertainment/Broadcast Communications
- ☐ F. Finance/Banking/Insurance
- ☐ G. Government/Defense
- ☐ H. Healthcare
- ☐ J. ISP/Online Service
- ☐ K. Manufacturing
- ☐ L. Marketing/Advertising
- ☐ M. Media (Publishing, Broadcasting)
- ☐ N. Retail/Catalog
- ☐ P. Telecommunications
- ☐ Q. Web Development/Design
- ☐ R. Other ____ (please specify)

3. YOUR JOB FUNCTION (check only one):

Technical Functions
- ☐ A. CIO/CTO or VP/Director MIS/IT
- ☐ B. Network Administrator
- ☐ C. MIS/IT Technical Staff
- ☐ D. Project Management - Technical
- ☐ E. Webmaster/Developer/Designer
- ☐ F. Software Developer
- ☐ G. VAR/Distributor

Non-Technical Functions
- ☐ H. CEO/CFO/COO, Owner, VP
- ☐ J. Manager, Finance/Accounting
- ☐ K. Manager, Marketing/Sales
- ☐ L. Project Management - Non-Technical
- ☐ M. Other ____

4. SIZE OF YOUR ORGANIZATION (check one only):
- ☐ A. 1-10 employees
- ☐ B. 11-100 employees
- ☐ C. 101-1000 employees
- ☐ D. 1001-10,000 employees
- ☐ E. Over 10,000 employees

5. YOUR ROLE IN PURCHASING INTERNET PRODUCTS (check one only):
- ☐ A. Final decision-maker
- ☐ B. Specify product or vendor
- ☐ C. Recommend product or vendor
- ☐ D. No decision-making responsibility

6. PRODUCT INTEREST (check all that apply):
- ☐ A. Access (T1/T3/Cable/ISDN/DSL)
- ☐ B. Content/Content Developers
- ☐ C. Databases/Personalization
- ☐ D. E-Commerce/Transaction Software
- ☐ E. Intranet Hardware
- ☐ F. Internetworking Software/Groupware
- ☐ G. Internet Telephony
- ☐ H. ISPs/Access Providers/Consultants
- ☐ J. Measurement Tools
- ☐ K. Security
- ☐ L. Servers
- ☐ M. Web Multimedia (audio/video/VRML, etc.)
- ☐ N. Web Page Authoring/Design
- ☐ P. Other ____

This form for Exhibit Hall admission only. To register for Conference sessions and workshops, see page 47.

Spring Internet World '97
Los Angeles Convention Center,
1201 South Figueroa St., Los Angeles, CA

Exhibits Open:
March 12: 10 AM - 6 PM
March 13: 10 AM - 6 PM
March 14: 10 AM - 4 PM

For qualified trade professionals only. No one under 18 admitted.

Every Internet/Intranet Supplier

Interested in exhibiting?

For information on exhibiting at this or future Internet World events, contact:

Chris Fischer
203-341-2923
cfisch@mecklermedia.com

Spring Internet World '97 is the largest exhibition of Internet products and services in history. Three halls, 600,000 square feet of technology, more than 600 exhibitors anticipated, including:

List of exhibiting companies contracted as of 11/8/96. The list is growing daily. Please check your official Spring Internet World '97 Show Guide when you arrive on site, or visit us on the Web at **http://events.iworld.com** for up-to-the-minute listings of exhibitors.

Spring Internet World Exhibitors as of 11/8/96

A

- A2i, Inc
- ABVS, Inc.
- Accordance Corp.
- ADC Kentrox
- Adobe Systems, Inc.
- AGIS/Apex Global Information Services
- Aimtech
- Alis Technologies
- Allaire Corporation
- Alpha Microsystems
- America Online Internet Services Company
- AMP eMerce
- Amulet, Inc.
- ANYwhere Online
- AP Professional
- Apple Computer
- Applix, Inc.
- Arachnid Software
- Arcom Electronics
- Artecon
- Ascend Communications
- AT&T
- Aventail Corporation

B

- Backweb
- BATS, Inc.
- Bay Networks
- BBBOnline, Inc.
- BBN Planet
- Best Internet
- Bigfoot Directory
- Bitwise Internet Technologies
- Black Sun Interactive
- Bluestone, Inc.
- BroadVision, Inc.
- BSDI (Berkely Software Design Inc.)

C

- CADIS
- Cadmus Interactive
- Caere Corp.
- Capella Worldwide
- Caravelle, Inc.
- Carronade Group
- Castelle
- Centura Software Corp.
- CheckFree
- Checkpoint Software Technologies, Inc.
- Cisco Systems, Inc.
- CIX-Commercial Internet Exchange Association
- ClariNet Communications
- CMP Media
- Cobb Group
- CommerceNet Consortium
- CompassWare Development, Inc.
- CompuServe
- Computer Associates
- Computer Currents Publishing, Inc.
- Computone Corp.
- Convergent Media Systems
- Corel Corp.
- Cosmos Bay Corp.
- Council of Better Business Bureaus
- Creative Digital Research
- CryptoCard, Inc.
- CyberCash, Inc.
- CyberGuard Corp.
- CyberSource Corp.
- Cyclades Corp.
- CyperPath Inc.

D

- Data General Corp.
- DataViz, Inc.
- Db-Tech, Inc./WebSci Technologies
- Decisive Technology
- DeltaPoint, Inc.
- Digex
- Digital Equipment Corp.
- Digital Style Corp.
- DirectNet
- Dun & Bradstreet
- Durand Communications Network, Inc.

E

- e.g. Software
- Earthlink Network
- EarthWeb
- EBT (Now part of INSO Corporation)
- Electronic Card Systems Corporation
- Empac International
- Enhance Security Products
- Eudora division of Qualcomm Inc.
- Evergreen International Technology, Inc.
- Evergreen Internet, Inc.
- Excalibur Technologies
- Excite, Inc.
- Exodus Communications

F

- Farallon Communications Inc.
- FastComm Communications
- faxSAV
- Federal Express
- Firefox Communications
- First Floor Software
- Folio Corp.
- The Forefront Group
- Forman Interactive
- Free Range Media
- FreeLoader, Inc.
- FreeShop Online
- Fujitsu
- Future Wave Software

G

- Gale Research Inc.
- General Magic
- Global Internet
- GO Magazine
- GoodNet
- Gradient Technologies
- GTE Internet Solutions

H

- Hewlett-Packard Company
- HLC-Internet, Inc.
- Hong Kong Trade Development Council
- Hughes Network Systems

I

- iCat Corporation
- i-Planet, Inc.
- I/PRO - Internet Profiles Corp.
- IBM Corp.
- ichat, Inc.
- ICon.CMT Corp.
- Iconovex Corp.
- ICVerify, Inc.
- IDG
- IFUSIONcom Corp.
- IMV Internet
- InContext Corp.
- Individual, Inc.
- Industry.Net
- InfoAccess
- Infonautics Corp.
- InfoNow Corp.
- Information Dimensions
- InfoSeek
- Inlet
- Inmagic, Inc.
- INSO Corp.
- Integrated Data Systems
- Integrix, Inc.
- Intel Corp.
- Interactive Marketing Services
- InterCon Systems
- Intermind Corp.
- Internet Business Solutions
- Internet One, Inc.
- Internet Outfitters
- Internet Productions
- Internet Security Systems, Inc.
- Internet Servers, Inc.
- Internet Shopping Directory, Inc.
- InterNex Information Services
- Intersé Corp.
- Interval, Inc.
- Iota Industries, LTD.

J

- J Koss Technologies
- JetForm Corp.
- John Wiley & Sons

K

- KeyLabs
- Knight-Ridder New Media Center

L

- LanOptics
- LEXIS-NEXIS
- Livingston Enterprises, Inc.
- Lotus Development Corp.
- Lucent Technologies
- Luckman Interactive
- Lycos, Inc.

M

- MacMillan Computer Publishing
- Macromedia
- MapQuest Publishing Group
- mBED Software
- McAfee
- MCI
- Metricom
- Microsoft Corp.
- Microsystems Software, Inc.
- Milkyway Networks
- Miller Freeman, Inc.
- Mustang Software

N

- Nebucon, Inc.
- net.Genesis
- Net Manage, Inc.
- Net Nanny, Ltd.
- Net Perceptions, Inc.
- Net Wizard
- NetCarta Corp.
- NetCentric Corp.
- NETCOM Online Communications
- NetConsult Communications
- NetGeneration Software, Inc.
- NetGrafx Internet Web Services
- NetPartners Internet Solutions, Inc.
- NetPhonic Communications
- NETSCAN Technology Corp.
- Netscape Communications Corp.
- NetScheme Solutions
- Network Intensive
- Network Solutions
- Network-1 Software + Technology, Inc.
- Nortel/Northern Telecom
- Novell, Inc.
- Novera Software
- !Nterprise Networking Services

O

- O'Reilly & Associates
- Object Design
- Objectivity
- Olympus Group
- ON Technology
- One Key-JA Enterprises, LLC
- Online Access Magazine
- Open Market, Inc.
- Open Text Intranet
- Outreach Communications
- OZ Interactive

P

- Pacific Bell Internet Services
- PARACEL, Inc.
- Paragraph International
- PC Today Magazine
- PC World Online Services Group
- Performance Technology

Passport Pricing Saves You $1,674!

Save up to $1,674 when you register for the Internet World Passport.
You'll have access to every session, every sponsored and general workshop, all in-hall special events, the exhibit hall, and receive the complete conference on CD-ROM — a $2,969 value*! You can do it all for only $1,295 when you purchase your Passport by February 14.

* *Hands-on Workshops and* Internet World *Magazine Industry Awards Luncheon not included.*

# of Value

Personal Library Software
Personal Productivity Tools, Inc.
Personal Training Systems
Phillips Internet Week
Pilot Network Services
PointCast, Inc.
Prentice Hall PTR
Prodigy Services Company
Progressive Networks
Proteon, Inc.
PSINet Inc.
Publications Resource Group

Q
QuadraCom
Quarterdeck Corp.
Quote.com, Inc.

R
Radnet, Inc.
Radview Software Ltd.
Raptor Systems, Inc.
RealSpace, Inc.
Resonate
RevNet
RNS (Rockwell Network Systems)

S
SAQQARA Systems
Sea Change Corp.
Secure Computing Corp.
Security Dynamics
Sendai Media Group
Sense8 Corp.
ServiceSoft Corp.
Silicon Graphics Computer Systems
Simply Interactive
SiteGen, Inc.
SmartDesk, Inc.
SoftTek, Inc.
SoftQuad, Inc.
Software.com, Inc.
Software Publishing Corp.
Sourcecom Corp.
Speedware
Spider Technologies
Spire Technologies
Spyglass, Inc.
Star Technologies
StellerSoft
Sun Microsystems
Sybase/Powersoft
Symantec

T
Technology Net, Inc.
Techwest Management, Inc.
3Com Corp.
Thuridion
Trancell Systems
Trend Micro Devices
Trilogy
TriTeal Corporation
Trusted Information Systems
Tumbleweed Software

U
U.S. Robotics
Ulysses Telemedia Networks
UMI
Universal Algorithms
Upside Publishing Co.
US Online, Inc.
USA.NET
USC-EC(2), Annenburg Incubator Project
USWeb
UUNet Technologies, Inc.

V
V-ONE
Van Nostrand Reinhold-VNR
VDOnet Corp.
VeriFone - Internet Commerce Division
Verity, Inc.
ViaGrafix
Vienna Systems Corp.
Virtus Corp.
VocalTec, Inc.
Vosaic
Voxware, Inc.

W
Web Publishing , Inc.
Web Techniques - Miller Freeman
WebFlow Corp.
WebMaster
WebMate Techologies, Inc.
The Well
Whistle Communications
White Pine Software
Worldata
WSI /Intellicast

X
Xantel Corp.

Y
Your Personal Net/Wolff New Media

Z
Zapa Digital Arts, Ltd.
Ziff-Davis Publishing
ZyXEL

How to Use This Program

To get the most out of this program brochure, it will help to familiarize yourself with some of the terms and icons used.

There are five types of conference program formats:

Sponsored Workshops *Pages 15-25*
Sponsored Workshops are concentrated sub-conferences on specific issues presented by an industry leader or association in conjunction with Spring Internet World '97. Sponsored Workshops offer a full day (or two days) of discussion and/or training on Internet applications, or significant Internet technology.

To register for any sponsored workshop, look for it on the registration form (page 47) and check the box. Sponsored Workshops are also included in the Conference Passport.

Admission to sponsored workshops includes all keynote addresses, morning and afternoon coffee breaks and admission to exhibits during exhibit hall hours.

General Workshops *Pages 26-30*
General Workshops are half-day intensive workshops focusing on one specific issue or technology. Each general workshop is two-and-a-half hours in length, allowing sufficient time for an in-depth look at a particular subject and usually a question-and-answer period at the end.

Registration for general workshops is by the day and is also included in the Conference Passport.

Hands-on Workshops *Pages 26-30*
Hands-on Workshops are two-and-a-half hour technical lessons with class sizes limited to only 30 people, allowing for greater instructor/attendee interaction. Each two people registered will share a computer workstation with one other person.

To register for any Hands-on Workshop, please indicate the workshop number on your registration form. As the number of seats is limited, workshops will be filled on a first-come, first-served basis.

Conference Sessions *Pages 32-43*
Conference Sessions span a wide range of subjects and offer you varying degrees of coverage. Many Conference Sessions offer you an opportunity to get an expert overview of a subject with which you may not be familiar; others offer panel discussions and predictions about new technologies and applications.

Conference Sessions may be purchased by the day or as part of the complete conference and are also included in the Conference Passport registration.

Keynotes *Page 5*
Keynote presentations are integrated with the conference program to allow registrants of any of the workshops or conference sessions to attend. We encourage you to hear these luminaries as they are included in your conference registration fee.

Use these Icons for Planning

Next to each General Workshop, Hands-on Workshop and conference session you'll find one or more of five icons:

M Marketing
T Technical
G General
B Business/Management
D Design/Graphics

While most attendees can benefit from almost any workshop or conference session, these icons indicate which types of attendees are most likely to receive the greatest benefit. Look for the these icons when planning your customized Spring Internet World '97 Conference itinerary.

At the Biltmore Hotel

Monday, March 10

10:00 AM - 4:00 PM

Sponsored Workshops

- *Adweek* Forum (Day 1)
  Pages 16-17
- Sun Microsystems Developer Day
  Page 15

10:00 AM - 12:30 PM

General Workshops

WS1
Hidden Revenue Opportunities
Page 26

WS2
Building ActiveX Controls with Visual C++
Page 26

Hands-on Workshops

HO1
Java Primer
Page 26

HO2
Introduction to Tripoli/JavaScript Style Sheets
Page 26

1:30 PM - 4:00 PM

General Workshops

WS3
Developing with CyberDog, Hot Sauce and Other Apple Internet Technologies
Page 26

WS4
Digital Marketing: Opening Frontiers in Web-based Commerce
Page 26

Hands-on Workshops

HO3
ActiveX and DCOM
Page 26

HO4
Java Beans: The Java Component Architecture
Page 26

At the Biltmore Hotel

Tuesday, March 11

10:00 AM - 4:00 PM

Sponsored Workshops

- *Adweek* Forum (Day 2)
  Page 17
- VRML World Developer Day
  Page 18

10:00 AM - 12:30 PM

General Workshops

WS5
Getting the Hang of UNIX
Page 27

WS6
Java Applets from A to Z
Page 27

Hands-on Workshops

HO5
HTML for Beginners: Principals of Page Building
Page 27

HO6
Using Cascading Style Sheets
Page 27

1:30 PM - 4:00 PM

General Workshops

WS7
Adding Java to Web Client/Server Architecture
Page 27

WS8
Mapping Your Internet Business Strategy
Page 27

Hands-on Workshops

HO7
Advanced HTML
Page 27

HO8
Java and CORBA: Connecting Distributed Objects
Page 27

Wednesday, March 12

9:45 AM - 5:15 PM

Sponsored Workshops

- Sun Microsystems/Java Computing Day
  Page 20
- ISPWorld (Day 1)
  Page 21
- *The Red Herring* Internet Entrepreneur Forum
  Page 19

10:00 AM - 12:30 PM

General Workshops

WS9
Systems "Recovery" with an Intranet: A 12-Step Approach
Page 28

WS10
How to Use the Web/New Media for Your Growing Business
Page 28

Hands-on Workshops

HO9
Introduction to VRML 2.0
Page 28

HO10
JDBC: Get Up and Running with the Java Database Connectivity API
Page 28

2:15 PM - 4:45 PM

General Workshops

WS11
Hard-nosed Administrative Tips
Page 28

WS12
Web Demographics
Page 28

Hands-on Workshops

HO11
Business Applications of VRML
Page 28

HO12
User Interface Design Paradigms
Page 28

Thursday, March 13

10:00 AM - 4:45 PM

Sponsored Workshops

- ISPWorld (Day 2)
  Page 21
- Intel Hybrid Applications Developer Day
  Page 23
- Apple Platform Developers Day
  Page 22

10:00 AM - 12:30 PM

General Workshops

WS13
Installing and Maintaining Firewalls
Page 29

WS14
Profitable Site Design for Financial Services
Page 29

Hands-on Workshops

HO13
Graphic Design for the Web
Page 29

HO14
Developing for ActiveX Controls with Visual Basic
Page 29

2:15 PM - 4:45 PM

General Workshops

WS15
Internet Strategies for the Financial Services Industry
Page 29

WS16
Push and Pull Publishing
Page 29

Hands-on Workshops

HO15
Finding and Evaluating Information on the Internet
Page 29

HO16
Internet Studio
Page 29

Friday, March 14

10:00 AM - 5:00 PM

Sponsored Workshops

- Internet Daily Stock Report's Finance Friday
  Pages 25
- Microsoft ActiveX Developer Day
  Page 24

10:00 AM - 12:30 PM

General Workshops

WS17
Building Complex Web Sites
Page 30

WS18
The Nuts and Bolts of Programming for the Web
Page 30

Hands-on Workshops

HO17
Multimedia Authoring for the Web
Page 30

HO18
Server-side Scripting Solutions
Page 30

2:30 PM - 5:00 PM

General Workshops

WS19
Advanced HTML Tips and Tricks
Page 30

WS20
Voice, Video and Data Collaboration
Page 30

Hands-on Workshops

HO19
Time-saving Automation Tools and Tips in PERL
Page 30

HO20
HTML for the Casual Webmaster
Page 30

Workshop descriptions begin on page 15.

All Workshops on Monday and Tuesday take place at the Biltmore Hotel.

At the Biltmore Hotel

Conference Sessions at-a-Glance

Wednesday, March 12

9:00 AM - 9:45 AM

Opening Keynote *............Page 32*
Robert Palmer, Chairman,
President/Chief Executive Officer,
Digital Equipment Corporation

10:00 AM - 11:00 AM

Session 111 ....Page 32
Domino, Lotus Notes
and the Internet

Session 112 ....Page 32
Intranets: Building Private Webs
for Corporate Constituents

Session 113 ....Page 32
Making the Internet
Safe for Business

Session 114 ....Page 32
Web Contracts

Session 115 ....Page 32
Beyond Mobile Computing:
Towards "Mobilized Computing"

1:15 AM - 12:15 PM

Session 121..............................Page 32
Content Selection Using Collaborative
Rating
and Filtering Techniques

Session 122..............................Page 33
NetWare in an Intranet Environment

Session 123..............................Page 33
Rapid Application Development
for the Intranet

Session 124..............................Page 33
21st Century Publishing Strategies

Session 125..............................Page 33
The Five C's of Web Marketing

Thursday, March 13

9:00 AM - 9:45 AM

Morning Keynote *............Page 36*
Frank C. Gill, Executive Vice
President/General Manager,
Internet and Communications
Group, Intel Corporation

10:00 AM - 11:00 AM

Session 211 ....Page 36
Internet Development with
Distributed Objects and Components

Session 212 ....Page 36
Internet and Intranet Firewalls:
Black Art vs. Industry Standards

Session 213 ....Page 36
The Art and Folly
of Content Repurposing

Session 214 ....Page 36
The Training Gap

Session 215 ....Page 36
Windows Applications on the Web

11:15 AM - 12:15 PM

Session 221 ....Page 37
The Kantor Group

Session 222 ....Page 37
The International Internet

Session 223 ....Page 37
Internet Security

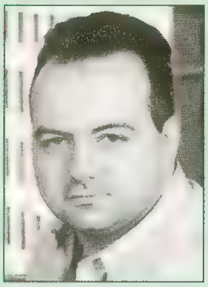
Session 224 ....Page 37
Customer Service on the Internet

Session 225 ....Page 37
The Webmaster Roundtable

Friday, March 14

9:00 AM - 9:45 AM

Morning Keynote *............Page 40*
Rob Glaser, President/CEO,
Progressive Networks, Inc.



10:00 AM - 11:00 AM

Session 311 ....Page 40
Strategic Web Marketing

Session 312 ....Page 40
Is Privacy a Thing of the Past?

Session 313 ....Page 40
Expanding Internet Infrastructure
Around the World

Session 314 ....Page 40
The Collision of Copyright
and the Internet

Session 315 ....Page 40
The Java Electronic Commerce
Framework

11:15 AM - 12:30 PM

Session 321 ....Page 41
On the Firing Line

Session 322 ....Page 41
The Ins and Outs of Java Beans

Session 323 ....Page 41
Emerging Business Models
on the Internet

Session 324 ....Page 41
The Web as a Distribution Channel

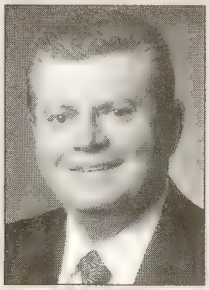
Session 325 ....Page 41
Will the Internet Replace the
Phone for Customer Support?

Conference Sessions at-a-Glance

Wednesday, March 12

1:15 PM - 2:00 PM

Afternoon Keynote *..........Page 34*
Dr. Gilbert F. Amelio
Chairman of the Board/CEO
Apple Computer, Inc.



2:15 PM - 3:45 PM

Session 131 ....Page 34
Real-time Internet Communication

Session 132 ....Page 34
Groupware or Intranet

Session 133 ....Page 34
Real-time Internet Gaming

Session 134 ....Page 34
Internet Personalization:
Sending a Focused Message

Session 135 ....Page 34
Web Auditing

4:00 PM - 5:30 PM

Session 141 ....Page 35
Agents and Personal Spiders

Session 142 ....Page 35
Directory Services: Turning Yellow
and White into Green

Session 143 ....Page 35
Building and Deploying Applications
on the Internet

Session 144 ....Page 35
Web-enabled Business Value

Session 145 ....Page 35
Getting Your Net Worth
Out of the Web

Thursday, March 13

1:15 PM - 2:00 PM

Afternoon Keynote *..........Page 38*
John R. Patrick, Vice President,
Internet Technology, IBM
Corporation

2:15 PM - 3:45 PM

Session 231 ....Page 38
Building Dynamic-Page
Web Applications

Session 232 ....Page 38
Guidelines to Choosing
an Optimal Web System

Session 233 ....Page 38
Publishers Survival Guide

Session 234 ....Page 38
Overcoming Customer Resistance to
Using Credit Cards on the Internet

Session 235 ....Page 38
Identity, Security and Authentication

4:00 PM - 5:30 PM

Session 241 ....Page 39
Real Companies Making Real Money
on the Internet

Session 242 ....Page 39
The State of Internet Security

Session 243 ....Page 39
The Personalization Revolution

Session 244 ....Page 39
Author Once, Publish Many

Session 245 ....Page 39
The Seven Keys to Effective Web Sites

Friday, March 14

12:45 PM - 2:15 PM

The Fourth *......................Page 14*
Annual Internet World
Magazine Industry
Awards Luncheon

2:30 PM - 3:30 PM

Session 331 ....Page 42
Personalization Panel

Session 332 ....Page 42
Integrating Legacy Applications
with CORBA

Session 333 ....Page 42
Internet Legal Roundtable

Session 334 ....Page 42
Web Advertising: Panacea or Pain?

Session 335 ....Page 42
Internet Video

3:45 PM - 4:45 PM

Session 341 ....Page 42
The Intranet: Unleashing the Power
of Data Warehousing

Session 342 ....Page 42
Fundamentals of Streaming Media

Session 343 ....Page 43
Server-side Scripting Languages

Session 344 ....Page 43
Multicast Networking: The Solution
for Internet Congestion

Session 345 ....Page 43
How to Test Your Web Page

Join Us and Celebrate the Innovators In Your Industry at a Special Luncheon During Spring Internet World '97

4th Annual Internet World Magazine Industry Awards

FRIDAY, MARCH 14, 1997
12:30 PM - 2:15 PM
LOS ANGELES
CONVENTION CENTER

In an industry driven by new **groundbreaking** innovations announced almost daily, it is a real **challenge** to select the one product that made the greatest difference…but that is exactly what the editors of *Internet World* magazine will do as they prepare to announce the *Internet World* Magazine Industry Awards for 1997.

The *Internet World* Magazine Industry Awards **honor** those who have **excelled** by creating and developing the applications and/or technologies which have most furthered the **growth** of the Internet as a medium for communications and **productivity.** The 1997 winners will be announced for the first time at a banquet luncheon on Friday, March 14th.

Be a part of the process. Only those individuals, products and services that are nominated are eligible to **win** an Award. All nominations will be reviewed by the Awards Committee, chaired by Michael Neubarth, Editor-in-Chief, *Internet World* Magazine. A winner for **Best of the Internet** will be chosen from one of the winners of the other six categories. Submit your nomination for the leading contributors in the following categories:

- **Outstanding Business Software Product**
- **Outstanding Consumer Software Product**
- **Outstanding Business Hardware Product**
- **Outstanding Consumer Hardware Product**
- **Outstanding Service**
- **Individual Achievement**
- **Best of the Internet**

Take a moment to think about the products that made the Internet easier to use or more productive for you or your company. Then send us your nomination by visiting **www.iworld.com/awards** and entering your choices. Then attend the Awards ceremony and join in a celebration to honor the best of the Internet!

Nominations will be accepted through 11:59 PM EST, Friday, January 31, 1997.

Please note: Admission to the Internet World Industry Awards luncheon is $45.00 per person. Reserve early. Seats are limited. Be sure to check the Awards Luncheon box on your conference registration form. For group sales, call Debbie Barnes at 203-341-2871.

1-Day Sponsored Workshop

SUN MICROSYSTEMS DEVELOPER DAY

Sun microsystems

Monday, March 10

Sun Microsystems has been an integral part of the Internet and intranets for more than 14 years. Its scaleable servers drive more Web sites than any other brand. And its innovative Java technology is quickly becoming a standard computing platform for the Internet and corporate intranets.

Get the latest on developing, deploying and managing next-generation Internet sites and intranet applications as Sun and its partners provide comprehensive training and updates in the areas listed.

10:00 AM - 12:30 PM

Sun Developer Day Kickoff: The Java Model in Enterprise Computing

See how seamlessly this platform-independent technology integrates into diverse computing environments, bringing greater interactivity, simplicity and functionality to real-world situations.

1:30 PM - 4:00 PM

Track 1: Develop

For developers, this track focuses on how Java technology can enhance Internet and intranet solutions. Topics include: Java for C++ Programmers, Java Beans and Joe: The Java Object Model, The Case for Server-side Java, Multimedia Java Deployment, Java Beans vs. COM/DCOM vs. OpenDoc.

1:30 PM - 2:30 PM

Track 2: Deploy

For MIS managers, this track will provide tips on building a corporate intranet or an Internet site. Topics include conducting, monitoring and administrating transaction-based services and Netra Server Solutions.

2:30 PM - 4:00 PM

Track 3: Manage

For IT executives, this track provides an overview of the issues involved in running your intranet or Internet services. Topics include building and managing secure Web sites, selling the intranet to your cfo and network tools.

Participating presenters will be announced at events.iworld.com.

Passport Pricing Saves You $1,674!

Save up to $1,674 when you register for the Internet World Passport.

You'll have access to every session, every sponsored and general workshop, all in-hall special events, the exhibit hall, and receive the complete conference on CD-ROM — a $2,969 value!* You can do it all for only $1,295 when you purchase your Passport by February 14.

** Hands-on Workshops and Internet World Magazine Industry Awards Luncheon not included.*

At the
Biltmore
Hotel

2-Day Sponsored Workshop

The ADWEEK Forum at Spring Internet World '97

ANA

AAAA

Reaching Customers and Building Brands in a Fast-Changing Digital Marketplace

The Web has shown an amazing ability to sucker the "lord of commerce" onto its eerie platforms. One hears of huge sums being spent on complex Websites — and more to maintain them for brief periods. Meanwhile, smaller, more agile marketers are beginning to find new markets of consumers who are hungry for information, deals and service. In this new world of one-to-one marketing, definite business models are beginning to emerge and publishers are still searching for ways to leverage the communities and brands they built in the hard-copy world. This is a conference of micro case studies in which veteran marketers candidly discuss the problems they've encountered and offer you insights into the tools and practices to adopt in order to capture the loyalty of the digital consumer.

If you're concerned with building and maintaining a commercial brand or site on the Internet, the *Adweek* Forum is geared for you. Specifically, for advertisers, marketers, publishers and broadcasters interested in moving brands onto the Web; Website developers; new media buyers and sellers; research and auditing specialists and new media venture capitalists and investors.

Register Now and Save

Registration is $695 for this two-day Sponsored Workshop. Early birds save $100 when you register by February 14, 1997. AAAA and ANA members qualify for an even steeper discount — call 800-632-5537 for details. Registration also includes admission to the Spring Internet World '97 Exhibit Hall — March 12-14 — with over 600 companies across 600,000 square feet of exhibits. See the registration form on page 47 of this brochure.

Monday, March 10

Day One - Monday, March 10

9:30 AM - 10:45 AM

What Surprises Does the Future Hold for Marketers?

A broad discussion of what's around the corner for dot.coms. How has the Web changed as a commercial medium in last two years? Are "content providers" able to make users pay for their services? What will advertisers pay? Should they be sponsors or advertisers? Where will the money flow — into global, national or local connections with the consumer?

Panelists: **Tom Suiter**, Founding Partner, CKS Partners; **Bill Bass**, Senior Analyst/Media & Technology Strategies, Forrester Research; **Rich LeFurgy**, Vice President of Advertising, Starwave [Mr. Showbiz-ESPN Sportszone]; **Todd Chaffee**, Senior Vice President/Emerging Markets & Technologies, VISA International; **Jonathan Nelson**, CEO/Founder, Organic Online. Moderator: **Andrew Jaffe**, Executive Editor, *ADWEEK*

11:00 AM - 12:00 PM

Workshop: Critical Elements of Dynamic Website Development

The creative leader of one of the world's top Website developers talks about what works and what doesn't in creating Websites for the Internet. How important is it to keep the viewers interested? How many advanced applications — audio pieces, hotjava video pieces, etc. — should you implement considering the still primitive technologies employed by most users? Vivid has developed sites for Windows 95, created the Johnny Mnemomic net. hunt for Sony New Technologies and designed and engineered the NAMES Project Website featuring the Aids Memorial Quilt.

Speaker: **Nathan Shedroff**, Creative Director & Co-Founder, Vivid Studios

1:30 PM - 2:30 PM

Using Traditional Media to Sell Internet Brands

Yahoo! got an early start dominating the Internet Guide category — but after establishing its brand almost solely by word of mouth, it decided it needed to employ traditional media — newspapers, radio, outdoor and even television — to solidify its brand position. Two top executives from Black Rocket and its client Yahoo! will present a case history of how they blended messages in traditional and new media to give the Yahoo! brand a dominant position in the Web guide category.

Speakers: **Karen Edwards**, Director of Brand Management, Yahoo!; **Mark Barden**, Partner/Account Planner, Black Rocket

2:45 PM - 4:00 PM

Does the Web Really Work for Advertisers?

The media spend on the Web is growing gently — too gently according to some critics. Brands from the *Fortune* 50 companies are still spending only a pittance compared to what they spend in other media. Most of the money seems to be going into Website development rather than banners, links and media sponsorships. In this panel, interactive marketers from some of the biggest brands in the world discuss how they see the Web developing as an advertising medium. Do they have enough information on the impact of their messages? Are they taking advantage of the leads and customer loyalty links the Web can develop? Are they satisfied with the content being offered by their media partners?

Panelists: **Larry Lozon**, Senior Vice President/Director, General Motors Cyberworks; **Marianne Caponnetto**, Director of Worldwide Media Strategy/Operations, IBM Corporation; **Shelley Zalis**, Senior Vice President/Interactive Division & Business Development, ASI Market Research; **David Verklin**, Executive Vice President, Managing Director, Hal Riney & Partners. Other speakers to be announced. Moderator: **Andrew Jaffe**, Executive Editor, *ADWEEK*

Day Two - Tuesday, March 11

9:30 AM - 10:45 AM

Consumer Service on the Web — What's Ahead

Several Web marketers are getting top marks for demonstrating how far relatively small, efficient Sites can go in beating established merchandisers to the Web marketplace. Amazon.com, drawing on a database of over one million books, for instance, has completely outdistanced competitors like Borders and Barnes & Noble in Web selling. Virtual Vineyards has built a Web following that Wine Spectator would envy. The Internet Shopping Network is now approaching its fourth anniversary and founder Bill Rollinson has come up with a code for successful Web retailing that would apply to any business. Each speaker will give a 15-minute case history, followed by a general discussion.

Panelists: **Leslie Koch**, Vice President/Marketing, Amazon.com; **Cyndy Ainsworth**, Director of Marketing, Virtual Vineyards; **Bill Rollinson**, Co-Founder & Vice President/Marketing, Internet Shopping Network

11:00 AM - 12:00 PM

New Ways to Increase Efficiencies in Interactive Media

Advertisers are frustrated at the limited audiences attending various sites. They like niches — but they want more reach for their media spend. Meanwhile, researchers are demonstrating how little impact banners can have — especially if they aren't refreshed constantly with new messages and graphics. As a result, advertisers are beginning to gravitate to the few companies able to leverage special proprietary technology to put their messages before different audiences on a variety of sites. Hear how these new media reps are changing the face of media selling. What new tools are publishers going to need to reassure advertisers of the impact of their message? What kind of server technology are they demanding? How can sites without access to this technology compete? What new forms of authentication and tracking are required to demonstrate effectiveness and what are advertisers doing with all this new information?

Panelists: **Wenda Harris Millard**, Executive Vice President/Marketing & Programming, DoubleClick, Inc.; **Roy Schwedelson**, Managing Partner, WebConnect; **John Danner**, President/Chief Executive Officer, NetGravity, Inc.

1:30 PM - 2:30 PM

Closer to Home: Is the Web Really a Local Medium After All?

Though newspapers have been trying to leverage the Web's unique properties to increase their hold on the local market, suddenly a series of robust national services have moved into this niche. What's all the shouting about? Can these local services deliver news about local events, movies, sales and steal the classified ads from the local papers? How much maintenance is required to help people learn more about their local communities? Are we talking Yellow Pages or something far more interactive and current?

Panelists: **Paul Westhorpe**, President/CEO, Cityscapes; **Lamar Rutherford**, Vice President/Marketing, City Search; **Lee de Boer**, Chief Executive Officer, New Century Network; **Ellen Siminoff**, Director of Communities, Yahoo!

2:45 PM - 4:45 PM

McKinsey & Co.'s View on Marketing to the Digital Consumer

A McKinsey & Co. team recently studied Websites of 95 *Fortune* 500 consumer marketing companies and concluded that most demonstrated "uninspiring applications that fall far short of the new media's potential." Drawing on an analysis of a few marketing applications — including a California chili retailer's Website and United Airlines United Connection — the team developed distinct views on what role digital marketing should play in the overall marketing effort and how to achieve maximum benefits. Michael Zeisser, one of the members of the team and a leader in the global consulting firm's Digital Marketing Initiative, talks about the opportunities that already exist to exploit the unique characteristics of networked-based media and defines a new approach for how consumer marketers can more successfully capture the full potential of digital marketing for their business.

Speaker: **Michael Zeisser**, Consultant, McKinsey & Co. Inc.

1-Day Sponsored Workshop

VRML WORLD DEVELOPER DAY

VRML WORLD

Tuesday, March 11

The VRML World Conference at Spring Internet World '97 provides developers, Webmasters and project managers an intensive one-day summit on the capabilities and promise of VRML for creating a myriad of business, entertainment and information applications, led by the best minds in VRML community.

10:00 AM - 11:15 AM

Real-time VRML: An Interface for a Changing World

Moderator: Mark Pesce, VRML Co-Creator, Author/Consultant
Panelists: Dan Greening, Ph.D. President, Chaco Communications, Inc.; **Rik Henderson,** Director of Technology Development, The Geosphere Project; **Farid Mheir,** Curator, The Virtual Cities Repository; **Karl Jacobs,** CEO, DimensionX

The combination of constantly changing data streams and on-the-fly generation of VRML worlds offers tremendous promise as a new interface for everything from satellite weather information to complex financial models. Explore the possibilities with experts working on solutions today.

11:15 AM - 12:30 PM

VRML-specific Authoring Tools

Moderator: Bernie Roehl, Senior Software Developer, Electrical and Computer Engineering Department, University of Waterloo, Author, *Special Edition - Using VRML*
Panelists: Mitra Miller, Chief Network Technology Officer, Paragraph International; **Roman Ormandy,** President, Caligari Corporation; **Michael Hilgenberger,** Vice President, Sales and Marketing, Integrated Data Systems

Since VRML's inception, several software packages have emerged to aid interactive Web designers in building navigable 3D worlds for their interactive Web sites. Features such as intuitive interface design, import capabilities, export options, handling of texture maps, assignment of behaviors, navigational metaphors, and object hierarchy, will be discussed and demonstrated by leading creators of the authoring packages.

1:30 PM - 2:45 PM

Tips/Tricks from Leading VRML Developers

Moderator: Richard Tilmann, Owner, Meshmart;
Panelists: Pascal Baudar, Creative Director, CyberTown; **Tony Rockliff,** Executive Producer, CyberTown; **Adrian Scott,** PhD., CEO, Aereal, Inc.

In the small period of time VRML has been around, several developers have begun to stretch the limits of VRML capabilities. See and hear how VRML is providing a rich new media form for Web developers to offer in their mix of interactive media.

2:45 PM - 4:00 PM

VRML 3.0 and Beyond

Moderator: Mark Pesce, VRML Co-Creator/Author/Consultant; **Panelists: Franz Buchenberger,** President/CEO, Black Sun Interactive; **Tony Parisi,** Chief Technical Officer, Intervista Software, Inc; **Bernie Roehl,** Senior Software Developer, Electrical and Computer Engineering Department, University of Waterloo, Author, *Special Edition - Using VRML*

With VRML 2.0 behind us, it's time to look to the future. Take a look at the next stage with prognosticators, standard-setters and experts who will handicap the race to take the standard to the next level.

Complete Conference on **CD-ROM.** This **$199 value** will be included with all conference orders of $595 or more. This CD-ROM contains:

- Verbatim written transcripts and visual presentations from virtually every session and speaker (including audience questions and answers).
- Speaker names, addresses, phone numbers and biographies to simplify contacts after the event.
- An easy-to-use interface, with full-text search and the ability to select and print transcripts.
- Complete listing of all exhibitors, including phone numbers.
- Support for both Windows and Macintosh computers.
- FREE Adobe Acrobat Reader (version 2.0) software.

Please Note: The Spring Internet World '97 Conference on CD-ROM will be available approximately six weeks after the event.

1-Day Sponsored Workshop

THE RED HERRING INTERNET ENTREPRENEUR FORUM

THE RED HERRING

Wednesday, March 12

The Internet success stories of the past two years inspire enormous optimism, but what lies ahead for the entrepreneur as this once uncharted marketplace becomes crowded and competitive? Forget the hype. Get an insider's perspective on the Web strategies that work from the leading magazine for technology entrepreneurs.

The Red Herring is the premier provider of strategic business information for the technology and entertainment industries. Attend the Internet Entrepreneur's Forum and learn how to topple your competitors and find the capital to turn your idea into this year's Yahoo!

Participating presenters
will be announced at events.iworld.com.

To learn more about *The Red Herring* magazine and the Internet Entrepreneur Forum, visit www.herring.com.

10:00 AM - 11:15 AM

From the Ground Up

How do you go from great idea to great business — from anonymity to press scrutiny — from one employee to 50? Is the rough road ahead really as rough as it looks? Get the scoop on the entrepreneurial experience from Internet start-up veterans. Learn the secrets of their success (and challenges) and their predictions for the online industry.

11:15 AM - 12:30 PM

It's a Dog-Eat-Dog Web

The Internet has dramatically changed the competitive playing field. So how can small players use the Internet to fight technology powerhouses? And how do you compete against the next Andreessen programming away in a college dorm? Don't swim in the shark tank alone. Lend an ear as clever entrepreneurs reveal the keys to successful competitive positioning on the Internet.

1:30 PM - 2:45 PM

The Venture Money Trail

The fundraising experience is a way of life for technology companies. A technology start-up might go through five rounds of private venture capital before offering its stock to the public market. The brain trust behind leading venture firms will take you through the entire food chain of technology finance — from business plans to recent bets placed on hot Internet start-ups. Don't miss a chance to pick the brains of these maestros of money.

2:45 PM - 4:00 PM

Internet Intellectual Property 101

Hear from the leading legal experts on issues related to the Internet: proprietary technology; product patents; digital copyright; and more! No legal mumbo-jumbo from the "suits" that write the contracts. You'll walk away with insight you need when there's millions at stake.

1-Day Sponsored Workshop

SUN MICROSYSTEMS JAVA COMPUTING DAY

Sponsored by: Sun microsystems
and its major Application Partners

Wednesday, March 12, 1997

Java Computing: Java in the Enterprise

Java is moving from Web page enhancements to the Enterprise network. This special workshop provides a day of education and breakouts that demonstrate how this groundbreaking technology is changing the way we do business.

10:00 AM - 10:50 AM

Java Gets Down to Business

Bill Phelan, Vice President of Technology, FTD

How is Java being used by real companies to do real business everyday? This session outlines how FTD is using Java Computing for its day-to-day business and what the application of this technology adds to the bottom line.

10:50 AM - 11:40 AM

Java Computing Vision

What is Java Enterprise Computing? Why should your company adopt it? A bird's eye view of the infrastructure, architecture and philosophy of the Java Enterprise model.

11:40 AM - 12:30 PM

AppFoundry

Netscape has created a bundle of the critical productivity applications that businesses will need to use the Java Computing model effectively. This session outlines the scope and implementation of the AppFoundry suite.

Afternoon sessions will focus on three aspects of the Java Computing model, with presentations from Sun's Major Application Partners program, including Dun and Bradstreet, Lotus, IBM, Applix, Open Connect, Cambridge Technology Partners and Borland. Sessions and topics will include:

1:30 PM - 2:20 PM

Business Applications:

- A New Generation of Java Enterprise Solutions
- Java and the Data Warehouse
- Moving to the Java Enterprise

2:20 PM - 3:10 PM

Electronic Commerce:

- Implementing Java Within the Electronic Commerce Framework
- Java and Security over the Internet
- The Benefits of Using Java to Solve Legacy Access Problems

3:10 PM - 4:00 PM

Java Development:

- Java Certification
- Building an Intranet Infrastructure
- Distributing Object Programming with Java

Participating presenters will be announced at events.iworld.com.

2-Day Sponsored Workshop

ISP WORLD

ISP WORLD

The ISP World Conference at Spring Internet World '97 offers Internet service providers a unique opportunity to learn and converse about critical issues dominating the Internet service landscape, from today's infrastructure and pricing conventions to tomorrow's expectations of fast, portable, omnipresent service.

Day One - Wednesday, March 12

10:00 AM - 11:15 AM

ISP Executive Roundtable

Sky Dayton, President/CEO, Earthlink; **David Garrison**, Chairman/President/CEO, NetCom Online Communications; **Doug Humphrey**, President/CEO, Digital Express Group

The nature of the Internet service business is changing rapidly as RBOCs, cable and long distance companies and any other business with rights of way to lay cable rush into the market. Hear from the executives who are steering their companies through increasingly choppy waters as the business becomes more complicated by the day.

11:15 AM - 12:30 PM

Changing Telecom Regulation

Ted Frank, Partner, Arent, Fox, Kitner, Plotkin & Kahn

As the Telecommunications Reform Act begins to loosen the reins on the big telephone and cable companies, how is the ISP landscape shifting? Already affected in some states are the traditional discounts from the RBOCs that have allowed ISPs to expand. What's next?

2:15 PM - 3:30 PM

Ensuring Quality of Service

Matthew Cutler, Founder/Director, Business Development, net.Genesis Corporation; **Simon Roy**, CEO, Accrue Software, Inc.

One of the great breakthroughs of the last few months is the rise of tools and services that allow ISPs to monitor the quality of their services from the point of view of a customer. Get a look at how these services work and what they reveal about the reliability of service.

3:30 PM - 4:45 PM

Alternate Strategies

Joe Firmage, Chairman/CEO, US Web

With a glut of companies offering flat-rate access for $19.95 per month, many of the largest ISPs have been experimenting with differentiating offers as the market becomes more crowded. From content bundling to distribution agreements with browser makers. Get a jump on the next phase of Internet service.

Day Two - Thursday, March 13

10:00 AM - 11:15 AM

State of the Internet

Joel Maloff, President, The Maloff Company

Are the Internet backbones up to the demands that are being placed on them today? Will they be able to handle the multimedia traffic promised tomorrow? Maloff provides a snapshot of the current anarchic infrastructure and shows you where the flaws are and how to work around them.

11:15 AM - 12:30 PM

Executive Roundtable II: New Entrants

Tom Evslin, Vice President, AT&T WorldNet Services; **Mark Fisher**, Marketing Vice President, Pacific Bell Internet Services

Big players are making huge bets on a booming Internet access business. See how the long distance, cable and local telephone companies are planning to enter and transform access provision.

2:15 PM - 3:30 PM

Midband to Broadband

Frank Wiener, Vice President/General Manager, DSL Products Division, Paradyne; **Bernie Schnieder**, Vice President, Strategic Business Development, Ascend Communications; **Pat Henkle**, Senior Product Manager for Broadband, US Robotics Network Systems Division

A slew of solutions to the problem of getting more robust connections to homes and offices are fighting for dominance. ISPs are faced with a dizzying array of service decisions, with no clear guide to which — if any — midband solution will win. See the major vendors of ISDN, DSL and higher-speed analog connection devices and hear what they have to say.

3:30 PM - 4:45 PM

Infrastructure of the Future

Morgan Littlewood, Director for BPX/AXIS, Cisco Systems, WAN Business Unit; **Dave Schriftgiesser**, Broadband Multimedia Networking Vice President, Lucent Technologies; **Jerry King**, Director, Internet Solutions Team, Sybase, Inc.

What will be required to move the Internet from its poky performance today to the all-in-one communication system of tomorrow? Gigabit Ethernet? ATM?

1-Day Sponsored Workshop

APPLE PLATFORM DEVELOPERS DAY

®

Thursday, March 13

10:00 AM - 11:15 AM

Cool Web Server Tools

Macintoshes host a surprising number of Web sites and offer more server-side tools than you might expect. This session will show off the latest and greatest Apple and third-party tools for hosting and serving pages and show you how you can leverage them to build robust but low maintenance solutions.

11:15 AM - 12:30 PM

Apple and the Best Java Experience

Apple intends to put the Java implementation on its platforms — from the MacOS to Pippin to the Newton — to be the absolute best of breed. The company is hard at work integrating Java into Apple systems technologies and adding run-time support for Java to the MacOS. Apples OpenDoc and JavaSoft's Java Beans component technology will be closely integrated, allowing the creation of open, modular, cross-platform component-based applications. Get the latest information on these and other efforts.

2:15 PM - 3:30 PM

Web Content Creation Tools 97: What's Next and What's Best

The publishing and design communities love their Macintoshes and this loyalty and dedication remain true as publishing goes electronic on the Web. This roundtable discussion on electronic publishing on the Web looks at what works and what doesn't from experts who create Web content and the developers who make the tools to build it.

3:30 PM - 4:45 PM

Stake Out Your Web Territory

Many businesses — from the largest multinationals to the smallest Mom and Pop shops — are staking out territory on the Web. Whether you have a new idea or would like to extend your current business, Apple and its innovative software developers have a variety of solutions that will get you selling on the Internet. Learn about easy set-up and low maintenance solutions like Pacific Coast's Web Merchant and Everyware's Tango Merchant, both built on top of Starnine's WebSTAR SSL server.

1-Day Sponsored Workshop

INTEL HYBRID APPLICATIONS DEVELOPER DAY

intel

Thursday, March 13

10:00 AM - 11:00 AM

Hybrid Applications on the Internet: An Overview

As software end-users continue to expect both a richer multimedia experience and Internet connectivity, developing hybrid applications continues to be the best way to break the bandwidth barrier, i.e. deliver rich media over the predominantly available 28.8 kbps connection.

In this informative panel discussion, Intel Corporation's Developer Relations Group program managers will present best known methods for applying hybrid technologies to a given software segment. Their case studies will provide you with real-life examples ranging from classic consumer software to emerging models of entertainment and commerce-oriented software all deriving product benefits from being connected applications.

In addition to the Intel technology discussions, third party development tool vendors will provide demos of the tools used in these examples, as well as other new development tools.

11:00 AM - 12:30 PM and 2:15 PM - 2:45 PM

Hybrid Applications for Consumer Software

The Internet provides a new set of opportunities and challenges to software developers. Intel's Developer Relations Group program managers, with some ISV partners, provide you with a brief overview of some of the choices they faced, and the resources and benefits available as they redesign their software to get connected.

In addition to the Intel technology discussions, there will be demos of the tools and applications that exemplify the advances in this arena.

Note: This portion of the Intel Workshop runs for two hours with a break for lunch.

2:45 PM - 4:45 PM

New Types of Hybrid Applications

As retailers, publishers and the entertainment industry move to take advantage of the power of the Internet, they must take into account its bandwidth limitations. New types of hybrid applications are of potentially great appeal to content developers from these areas. Intel is working with a number of these companies to develop technologies which provide an end-to-end, robust solution to deliver these new hybrid apps to consumers via their Internet-connected PCs.

Intel's Developer Relations Group program managers and several partners give you their perspectives on the technological implications and share the business considerations they face as they plan to compete in this rapidly growing segment.

1-Day Sponsored Workshop

MICROSOFT ACTIVEX DEVELOPER DAY

Microsoft®

Friday, March 14

10:00 AM - 11:15 AM

Internet/Intranet Strategy

Here's your inside look at Microsoft's strategy for both the Internet and intranet. The discussion will cover how Microsoft is presenting a common platform for Web developers to target from client to server, how Microsoft and others are complementing that platform with a wide set of authoring and development tools, and how this enables the easy creation of dynamic, interactive Web-based applications in Internet/intranet environments.

11:15 AM - 12:30 PM

Active Server: The Foundation for the Next Generation Site

The active server environment makes it easy to extend Web servers, build server applications and create distributed components. You can build scaleable, reusable components that are part of a distributed transaction environment without having to do the low-level grunge work traditionally associated with writing server applications. Denali, part of Internet Information Server, makes it easy to develop, deploy and manage rich, dynamic Web content and applications using any scripting language. Microsoft's Internet Information Server and Denali provide a powerful model for building and maintaining rich, dynamic content and applications.

2:30 PM - 3:20 PM

The ActiveX Client: Internet Explorer

Microsoft Internet Explorer offers a powerful platform for Web sites and Web-based applications. You can already customize and extend the browser's capabilities, for example, to serve as an application front-end. In this session, you'll examine the architecture that makes Internet Explorer 3.0 the most powerful application for building Web content and applications. You'll also analyze how Microsoft will merge the "Best of the Web" with the "Best of the Windows User Interface" through Internet Explorer 4.0 which includes Active Desktop and Themes. In addition, you'll learn of future technology releases that will include richer layout choices, easy access to data and a much more powerful object model allowing truly dynamic HTML.

3:20 PM - 4:10 PM

Activating Your Site Using Denali and Normandy

Dish up dynamic and personalized content to your users with Denali and Normandy - without imposing any browser dependencies. Learn how to use scripting and components to provide dynamic, interactive content. Take advantage of third party server components to easily extend your Web site with rich functionality that's already tested and ready to go. See how the set of server components included in Microsoft's Normandy can be used to quickly build a personalized community for users.

4:10 PM - 5:00 PM

Microsoft Normandy

This session will present you with an overview of Normandy — an integrated platform for commercial grade Internet services based on Windows NT. Microsoft Normandy offers an ideal infrastructure for network operators, ISPs and online service providers. In addition, Microsoft will offer Normandy-based solutions to a diverse group of customers ranging from Internet Content Providers to corporate Web sites.

1-Day Sponsored Workshop

INTERNET DAILY STOCK REPORT'S FINANCE FRIDAY

INTERNET
DAILY STOCK REPORT

Friday, March 14

10:00 AM - 11:15 AM

The Big Picture: Internet Industry Overview — Buy, Sell or Get Out of the Way?

The commercialization of the Internet has led to many advanced multimedia features that seemingly only huge corporations can afford to create or buy. Is the age of the entrepreneur's Web over? You'll take a look at software, security, commerce, hardware and content. You'll learn where the opportunities are for bright ideas amid a world of ever-deepening pockets needed to play at this high-stakes table. Examples include entrepreneurs who have built small ideas into big successes and how they financed it along the way. On the flip side, get the insights from the leading corporations as to what they look for in a hot start-up to partner with or simply buy outright.

11:15 AM - 12:30 PM

The Prince and the Pauper: Content Is King But What's It Worth?

In a world of widgets, how does Wall Street value that most elusive of tangibilities, the very essence of any media: content? Dozens of Web content companies have plied the public or private waters for capital, from Wall Street to Sand Hill Road. See how the leading analysts and venture capitalists benchmarked some of the more popular offerings, and why some didn't make the cut. Also, get the inside scoop from those content producers turning a buck and how they do it — getting an investor's attention in the first place.

2:30 PM - 3:45 PM

The Hollywood/Web Walk Of Fame: Look Who's Talking Now?

The movers and shakers of the movie and TV business meet the movers and shakers of the Net.

Movie and TV Web sites have become instant popular successes drawing eyeballs to their sites — but what about revenue? Does Hollywood have a game plan for actually making money in these entertainment-rich endeavors? This session features examples of current sizzling creative efforts and some cool ones underway. Find out if the Web is just another moving billboard for a film or its own medium with original content that can generate real dollars. The billion-dollar media companies speak up, along with the producers, directors and agents of the new era. TinselWeb anyone?

3:45 PM - 5:00 PM

Honey, I Shrunk the Web

Handheld Web browsers, e-mailers, smart TVs, network computers, cellular phone Web devices, Web TV. Pretty soon your toaster could be an Internet browser device. Find out why the hot prospects for the burgeoning non-PC Web appliances have everyone from Microsoft to Intel and half of Silicon Valley scrambling for killer applications for this new untapped frontier. This session goes beyond the hype as our panel of experts sorts through the PR and places its bets on which devices and applications could become universally accepted (read: big bucks).

Pre-Conference Workshops

GENERAL AND HANDS-ON WORKSHOPS

Monday, March 10

10:00 AM - 12:30 PM

WS1 M B

Hidden Revenue Opportunities

Jill Ellsworth, Ph.D., Senior Partner, Oak Ridge Research

Critics of the Web, looking for the big payoffs from the massive investments of the last year ask, "Where's the money?" Often the answer is not easy to see. This session presents data about making money, how to integrate your Web marketing and explores opportunities such as co-marketing, sponsorships, existing cost displacement and efficiency from integrating intranets with the Internet.

WS2 T

Building ActiveX Controls with Visual C++

Microsoft Corporation

ActiveX components put OLE controls on a radical diet, eliminating up to 75 percent of the required interface. Learn to build lightweight, reusable objects that embed in both browsers and applications and see how ActiveX is transforming the concept of Internet applications.

HO1

Java Primer

David Koosis, Technical Director, ISC Consultants, Inc.

✋ Although Java is not the most difficult language to learn, it presents a formidable obstacle for non-programmers who want to embed programs in their Web pages. This workshop will provide the boost you need to begin your Web programming career.

HO2

Introduction to Tripoli/JavaScript Style Sheets

Bryan McCormick, President/Creative Director, Broadway Interactive Group

✋ Style sheets merge the design skills of desktop publishing with the immediacy of the Web without breaking the Internet backbone with huge graphics. With the introduction of Netscape's JavaScript-enabled Style Sheets and Microsoft's Tripoli technology, style sheet elements become scriptable objects that can react dynamically to user input. Learn to use these technologies to spice up your pages.

1:30 PM - 4:00 PM

WS3 B T

Developing with CyberDog, Hot Sauce and Other Apple Internet Technologies

Apple Computer Inc.

Apple Computer has been busy extending its platform to the Internet. With the planned introduction of the CyberDog OpenDoc component model directly into the Mac OS in January, Apple is rapidly remaking itself as an Internet company. Get the latest developer information from the source.

WS4 M B

Digital Marketing: Opening New Frontiers in Web-based Commerce

Larry Smith, Principal/Managing Partner, U.S. Interactive

Mastering a new concept called "Digital Marketing" will be the key that drives (or stalls) the ultimate success of companies seeking to exploit Internet commerce. Taken to its full realization, digital marketing interconnects all networks, companies, media and processes — moving rapidly beyond electronic connections, to impact and transform individual and shared business practices. Attendees will learn how to use this new Web marketing capability, "interactive brand management," to deliver widespread brand awareness, increased market share and turbo-charged revenues to their companies.

HO3

ActiveX and DCOM: The Web Without http?

Timothy J. Ewald, Principal Consultant, Obelisk LLC

✋ ActiveX is more than control widgets on a page. This workshop will show you how to build full intranet applications using the Distributed Component Object Model (DCOM) to link a Web-based client to components spread throughout your network.

HO4

Java Beans: The Java Component Architecture

David Koosis, Technical Director, ISC Consultants Inc.

✋ Why should Visual Basic and Delphi programmers have all the fun? The Java Beans API brings drag-and-drop software reuse and rapid application development tools such as Borland's Latte, to Java. Learn the ins and outs of this strategically critical Java API.

✋ **Hands-on workshops are limited to 30 people, two people per computer workstation. Look for this symbol if you are interested in a hands-on workshop.**

M Marketing

T Technical

G General Interest

B Business/Management

D Graphics

At the Biltmore Hotel

Pre-Conference Workshops

GENERAL AND HANDS-ON WORKSHOPS

Tuesday, March 11

10:00 AM - 12:30 PM

WS5 T G

Getting the Hang of UNIX

Vincent Lowe, The Computer Classroom

Even as the Internet begins to become a standard feature of all common operating systems, UNIX remains the workhorse of the network of networks. Long the domain of gurus, the highly customizable OS with cryptic commands is often perceived as the most user-hostile operating system in computing. This session will demystify UNIX for the uninitiated.

WS6 B T

Java Applets from A to Z

Irfan Virk, Vice President of Internet Services, Brainstorm Technologies

Learn all about developing Internet applets and applications in Java. This session covers the theory and practice of Sun's cross-platform language and provides an introduction to developing applets for multimedia page elements, database access and business applications.

HO5

HTML for Beginners: Principles of Page Building

David Sachs, Assistant Dean, Pace University; **Pete Stair,** President, Mycroft Information LLC

Learn the basics and some of the tips of the pros as you get your feet wet building Web pages. This session will also examine some of the tools emerging to automate HTML creation.

HO6

Using Cascading Style Sheets

Bryan McCormick, President/Creative Director, Broadway Interactive Group

Cascading Style Sheets, part of the latest W3C proposed HTML standard, promise the page markup power designers have grown accustomed to in traditional electronic publishing — including generating the text effects that have up to now been possible only with bandwidth-hogging graphics. Learn what's possible and how to do it.

1:30 PM - 4:00 PM

WS7 B T

Adding Java to Web Client-server Architecture

Len Halio, President/CEO, Gradient Technologies

Despite all the intranet hype, Web technology lacks the maturity needed to run secure, mission-critical applications that organizations need. This workshop will explain how Java's growing popularity, together with new intranet infrastructure products and Web tools, give developers solutions for rapid application development, high performance, reliability and the security needed for corporate intranets.

WS8 M B

Mapping Your Internet Business Strategy

Daniel Dern, President, Dern Associates, Author, "The Internet Guide for New Users"

This strategic management-level tutorial will teach you how to map out your Internet strategy for intranet applications, employee Internet access/use, and Web/Internet presence. You'll learn how to identify and match up your business goals with Internet services, and assess potential benefits. You'll also develop a personal Internet strategy and resource "hot list" profile.

HO7

Advanced HTML

Lori Hylan, Web Producer, Macromedia, Inc.

HTML is a moving target. Even with the "settlement" on HTML 3.2 earlier this year, staying on top of the latest extensions and capabilities of the basic markup language — never mind proprietary extensions — is a full-time job in itself. This session will bring you up to date with new authoring extensions in HTML 4 and give some clues as to where it will go next.

HO8

Java and CORBA: Connecting Distributed Objects

David Koosis, Technical Director, ISC Consultants Inc.

CORBA is a widely-accepted open standard which you can use to communicate between distributed objects deployed on different platforms and written in different programming languages. You can use CORBA, for example, to connect Java front-ends to legacy or time-critical systems written in C or C++. Find out how and why to use Java and CORBA together. Audience: programmers and people evaluating distributed object strategies for Java.

M Marketing
T Technical
G General Interest
B Business/ Management
D

GENERAL AND HANDS-ON WORKSHOPS

Wednesday, March 12

10:00 AM - 12:30 PM

WS9 B T

Systems "Recovery" with an Intranet: A 12-Step Approach

Mitra Miller, I-Net Services Project Manager, BSG Alliance/IT

One of the key things missing in the intranet hype is a structured, methodological approach to understanding, planning and implementing the technology. This presentation, based on the book "Building the Corporate Intranet" (co-authored by Miller with Steven Guengerich, Douglas Graham and Skipper McDonald of BSG), outlines a 12-step approach to harnessing intranets for business.

WS10 M B D

How to Use the Web/ New Media for Your Growing Business

Larry Kesslin, President, Let's Talk Business Network, Inc.; **Miles Spencer,** Founder, Cove Associates and Moneyhunt Properties

From locating information on conferences and trade shows to personal information and clipping services, the Internet is a must for any business owner. This session will show you how to find information on the Internet that could be critical for your business and will provide you with a bookmark list of Web sites that could help you solve many of your business problems.

HO9

Introduction to VRML 2.0

Mark Pesce, Co-creator VRML, Author/Consultant

✋ Virtual Reality Modeling Language (VRML) has created a new dimension on the Web. The introduction of VRML 2.0 added integration with other datatypes and languages to allow 3D space builders to make their worlds come alive. Learn how to add Java programs, HTML links and more in this hands-on workshop.

HO10

JDBC: Get Up and Running with the Java Database Connectivity API

David Koosis, Technical Director, ISC Consultants Inc.

✋ Looking for an easy way to connect Java to your corporate data? JDBC may be the answer. In this seminar, learn tricks, traps and tips for getting up and running with JDBC. Learn the benefits and disadvantages of JDBC as compared to other methods of data access. Learn your options for connecting Java to Sybase, Oracle, S-SQL and other popular databases. Audience: programmers and team leaders evaluating or about to start working with JDBC and/or other Java database access methods.

2:15 PM - 4:45 PM

WS11 B T

Hard-nosed Administration Tips

Vincent Lowe, The Computer Classroom

This session will cover issues that affect performance and reliability for Internet servers, including backup strategies, RAID technology, performance monitoring and capacity planning. Solutions from various vendors, including Sun, SCO and IBM will be discussed. This session is appropriate for apprentice and novice system administrators.

✋ Hands-on workshops are limited to 30 people, two people per computer workstation. Look for this symbol if you are interested in a hands-on workshop.

WS12 M B G

Web Demographics

David Sachs, Assistant Dean, Pace University; **Pete Stair,** President, Mycroft Information LLC

Knowing the Internet audience is extremely important, not only for marketers, but also for anyone who has a message to deliver. This workshop reviews the sources that currently profile and describe those individuals who are using the Internet. It also looks at ways to find out who is looking at your Web site and how to track their usage. In addition, ideas for making Web sites more inviting and engaging will be presented.

HO11

Business Applications of VRML

David Frerichs, VRML Product Manager, Silicon Graphics Inc.

✋ 3D worlds are a flashy addition to the Web, but does the technology have a use beyond immersive spaces for consumers? Examine some of the ways that adding a third dimension to your Web site can expand the horizons of your business and its operations.

HO12

User Interface Design Paradigms

Heather Champ, Creative Director, The Primary Group

✋ An in-depth look at how to structure a site so that it balances transparency — the ability for users to intuitively understand where to go for the information they're seeking — and your aesthetic and technical goals. This workshop provides real-world examples of the best and worst of the Web plus how to use new technologies effectively.

M Marketing
T Technical
G General Interest
B Business Management
D

GENERAL AND HANDS-ON WORKSHOPS

Thursday, March 13

10:00 AM - 12:30 PM

WS13 ⊕

Installing and Maintaining Firewalls

Phil Burton, Senior Product Manager, Security Products, SunSoft, Inc.

Firewalls are a critical part of every organization's security strategy. This workshop examines the detail of the security issues that firewalls can protect against, the balance between security and functionality, and implementation issues associated with various firewall technologies. This discussion will provide practical guidance for system administrators who are faced with implementing and maintaining their company's critical Internet connections, while keeping internal computing resources safe and secure.

WS14 M B

Profitable Site Design for Financial Services

Sherri Neasham, President, Financenter, Inc.

The Internet can bring customers closer than ever before to financial service companies, giving them better control of their accounts. What are the secrets to building a successful Web-bank or online trading service? This session examines which financial Web sites are profitable, how successful sites are designed, how much they cost to build, and the features, services and what functions make sense in an online environment.

HO13

Graphic Design for the Web

Marcus Pierce, Design Director/Webmaster, *The Economist* Intelligence Unit

Learn graphic design from a true Webmaster, who knows that to achieve brilliance in Web design takes more than a solid understanding and utilization of HTML. It takes years of marketing experience, an acute business acumen, and inspired creative vision. Taught by the Web designer of one of the most well-respected publishing firms in the world.

HO14

Developing ActiveX Controls with Visual Basic

Microsoft Corporation

The component-building and extending features of Visual Basic 5 brings ActiveX Control development to the millions of VB aficionados. Learn how to build new controls from scratch, from existing VB widgets and how you can extend existing controls with new properties and events.

2:15 PM - 4:45 PM

WS15 M B

Internet Strategies for the Financial Services Industry

Moderator: Tim Duncan, President, Duncan Resource Group Inc./CorpFiNet

Panelists: To be announced

This session will explore the successful strategies and technologies used by companies in the financial services industry to market products, communicate with customers and transact business over the Internet. The panel will cover the hot issues affecting the finance industry, including the hurdle of creating content for successful sites, the delivery of prospectus and other financial information online, and the ever-present security problems firms must deal with.

WS16 M B G

Push and Pull Publishing

Moderator: Julie Chapman, President, Infoworks; **Panelists: Tom Baker,** Manager, Business Development, *Wall Street Journal Interactive*; **Kelsey Felander,** Vice President, Marketing, Back Web Technologies; **Brian Goffman,** Director of Business Development, Pointcast

The Web is a "pull" publishing medium; e-mail is a "push" medium. Pushing information gets attention, but may annoy or overload your target audience. Pulling is polite and a plus, for advertising is self-selecting, allowing you to target your audience directly, but requires lots of work to get the attention of a potential reader. Which makes the most sense for you? This panel examines some of the advantages and disadvantages of each approach and looks at some of the tools to help you design and build your service.

HO15

Finding and Evaluating Information on the Internet

Louis Rosenfeld, President, Argus Associates; **Peter Morville,** Vice President, Argus Associates

The exponential growth of information on the Internet is a blessing and a curse. Vast repositories of valuable information are within reach. However, finding just the data you need among the terabytes of irrelevant information can be all but impossible. This hands-on tutorial introduces attendees to the directories, virtual libraries and search services that cut the Internet down to size.

HO16

Internet Studio

Microsoft Corporation

Internet Studio, the end-to-end application development environment for Microsoft's Active Platform, unifies and simplifies many of the tasks that face both enterprise- and entertainment-oriented Webmasters. Get up to speed in this hands-on tutorial.

M Marketing
⊕ Technical
G General Interest
B Business/Management
D Design/Graphics

GENERAL AND HANDS-ON WORKSHOPS

Friday, March 14

10:00 AM - 12:30 PM

WS17 D B ⊕

Building Complex Web Sites

Louis Rosenfeld, President, Argus Associates, Inc.; **Peter Morville,** Vice President, Argus Associates, Inc.

The design of complex Web sites requires an interdisciplinary approach that brings together professionals with experience in information architecture, graphic design, programming, system administration and marketing. Planning is essential in developing an information service that will be easy to use and manage. Whether you're launching an online newspaper, an interactive product catalog, or simply creating an electronic storefront for your business, this workshop will help you to develop a design philosophy and information architecture model that will scale gracefully over time. Topics to be covered include conceptual design, organizing people and information, building Web development teams, phases for site development and marketing your Web site.

The presenters helped create Web sites for Borders Books & Music, UMI, Consumers Power, *Barron's* Magazine, the University of Michigan and many more organizations.

WS18 D ⊕

The Nuts and Bolts of Programming for the Web

Bill Weinman, Technologist, BearHeart Technology Group

What skills and tools are necessary for Web Programming? This session covers the current state-of-the-art for Web programming, including details of HTTP, CGI, PERL, JavasScript and HTML. Practical skills are emphasized over less accessible "bleeding edge" technologies, so you can build a hot site that works today and is useable by a wide audience.

HO17

Multimedia Authoring for the Web

Jack Powers, Director, Graphic Research Laboratory, Inc.

Video, animation and sound on a Web site can enhance a user's experience, bringing them back, or it can repel them as they wait for big files to download. Learn how to add multimedia elements to a site without trying your customer's patience.

HO18

Server-side Scripting Solutions

Vincent Lowe, The Computer Classroom

The modern Web audience demands true interactive features from its favorite sites. Web administrators may choose from a variety of tools to provide these features. Whether it's JavaScript, ActiveX, or CGI scripting with a variety of APIs, the details of implementation are similar in many ways. Get an overview of the leading SSS solutions in this theory and practice workshop.

2:30 PM - 5:00 PM

WS19 D ⊕

Advanced HTML Tips and Tricks

Heather Champ, Creative Director, The Primary Group; **Lori Hylan,** Web Producer, Macromedia, Inc.

Ever see something on the Web and wonder how to do it? Need more information on how to implement cascading style sheets? Is a GIF animation or a Java Applet the right way to do that nifty dancing logo you've been dreaming of? Ask our panel.

WS20 B ⊕

Voice, Video and Data Collaboration

Blake Irving, Group Manager, Internet Platform and Tools Division, Microsoft Corporation; **David Rose,** President, Interactive Factory

Real-time collaboration has moved from the world of proprietary networks and custom solutions to today's Internet telephony, whiteboarding and video conferencing are the first applications to make use of emerging Internet standards. What issues stand in the way of a successful collaborative Internet environment? What standards are emerging and who's backing them?

HO19

Time Saving Automation Tools and Tips in PERL

Paul Helinski, Owner/CEO, World Media Services

Much of a Webmaster's day is spent repeating mundane administration tasks. In this seminar learn how to reduce this wasted time with CGI programming in PERL. Source code is included, with setup instruction.

HO20

HTML for the Casual Webmaster

David Sachs, Assistant Dean, Pace University; **Pete Stair,** President, Mycroft Information LLC

Get a grasp of the basic concepts for developing Web pages in this hands-on workshop for the beginner. From hard-coding to the tools that will save you time and effort, this session will walk you through your first Web page.

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Internet World Asia '97
Putra World Trade Centre

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Wednesday, March 12

9:00 AM - 9:45 AM

Opening Keynote

Robert Palmer, Chairman, President/ Chief Executive Officer, Digital Equipment Corporation

digital

10:00 AM - 11:00 AM

Session 111 B T

Domino, Lotus Notes and the Internet

Todd Hunter, President, WorkFlow Designs, Inc.; **Keith McCall,** Director, Internet Applications, Lotus Development Corporation; **Eric Sachs,** Vice President, Research and Development, WorldCom

With Lotus Notes 4.5 — called Domino — Lotus merged its Groupware with the Web. How good is the marriage? This session shows you how secure, interactive applications can be built using both technologies together.

Session 112 B

Intranets: Building Private Webs for Corporate Constituents

Uday O. Pabrai, Director, Net Guru Technologies, Inc.

This session will give you an up-to-date overview of Internet and intranet architecture, protocols and infrastructure. The various technology components required for corporate intranets along with information on the dominant and emerging vendors will be discussed.

Session 113 M B G

Making the Internet Safe for Business

Win Treese, Director of Security and Advanced Technology, Open Market, Inc.

The rapid growth of the Internet has opened new doors for global electronic commerce allowing for an easy exchange of information, goods, services and currency. Industry experts believe that now that EC technology is sound, the greatest challenge ahead is to educate potential customers of the benefits of shopping on the Internet. While impressed with Web sites, animation and the entertainment value on the Internet, many of your potential customers are still hesitant to make purchases with their credit cards because of a perceived lack of Internet security and reliability. Treese will discuss the reality of where Internet security is today, the risk of using credit cards and the best ways you can build customer confidence.

Session 114 B G

Web Contracts

Jonathan I. Ezor, New Media Attorney, Davis & Gilbert

A discussion of the types and provisions of the contracts you can use to build, maintain, host, and buy and sell advertising on Web sites. The session will focus on issues regarding ownership; representations and warranties; performance requirements; termination provisions; and approval of content.

Session 115 B T

Beyond Mobile Computing: Towards "Mobilized Computing"

Mark Yahiro, Vice President of Marketing and Business Development, Hitachi PC Corporation

To survive today, the typical mobile worker must remain attached to the Internet, intranets, e-mail and other sources of mission-critical information, and must also maintain constant communications with coworkers and customers. While mobile computing tools detach workers from their office, "mobilized computing" moves beyond that disassociation toward the constant connection and synchronicity that doing real-time business demands. This session will explore how you can identify and implement the key technologies that can fully empower mobile workers.

11:15 AM - 12:15 PM

Session 121 M B T

Content Selection Using Collaborative Rating and Filtering Techniques

Ron Warris, Executive Vice President, Technology, Net Shepherd Inc.

Finding a way to select and deliver Net-based information that is both relevant and appropriate is challenging the best minds in the development community. PICS (Platform for Internet Content Selection), an industry consortium, has established a standard for defining content rating systems, a syntax for rating labels and various methods for distributing labels. But who creates the ratings, and by what criteria should sites be evaluated? This session will help you navigate the latest techniques in rating and filtering Internet content. A special emphasis will be placed on ICS (Interactive Content Selection), the newest tool you can use to sort, select and deliver information based on user-defined parameters.

Session 122 B T

NetWare in an Intranet Environment

Chris Johnson, Product Line Manager, Internet Commerce Division, Novell, Inc.

Does bringing the Internet into the enterprise replace or enhance today's LAN? With Novell NetWare holding a dominant share percent of the LAN market, the answer depends on how seamless the connection is between NetWare and the Net. This session explains how to turn your NetWare network into a Web publishing environment and addresses critical issues such as security, performance, access control management and leveraging NetWare Directory Services.

Session 123 T

Rapid Application Development for the Intranet

Stephen Shannon, Senior Product Manager, Backstage, Macromedia Inc.

Get a first-hand look at what leading-edge companies are doing with Web technology to improve efficiency inside their organizations. The kinds of processes being improved. The organizational and cultural impact of these changes. How to get these changes rolling in your own company without spending a lot of time or money. This session will highlight tools available for rapid development of exceptional intranet applications.

Session 124 M B T

21st Century Publishing Strategies

David Holtzman, Chief Scientist/Manager, Business Development, infoMarket, IBM Corporation; **Stewart Ugelow,** President, Student.Net

The Internet has opened a nascent argument about the future of mass- or micro-market publishing. With a low-cost, universal distribution system for information, what factors will be required to build a successful business from content? This session looks at some of the possibilities including pay-per-view schemes that enforce copyright reimbursement and targeted micro-marketing solutions.

Session 125 M

The Five C's of Web Marketing

Jim Sterne, President, Target Marketing

Jim Sterne, author of "World Wide Web Marketing" and "Customer Service on the Internet" zeros in on the essential ingredients of successful commercial Web site design strategy. This session provides a look at the possibilities today and the issues facing you tomorrow:

Cool — *Your site must be compelling to your specific audience.*

Content is King — *But what is it? Who's got it? When is it too much?*

Context — *How to make your information easy to find, meaningful and useable.*

Contact — *The Internet is a two-way street; are you ready to communicate?*

Control — *What it means to manage a customer as an asset?*

CONFERENCE SESSIONS

Wednesday, March 12

1:15 PM - 2:00 PM

Afternoon Keynote

Dr. Gilbert F. Amelio, Chairman of the Board/CEO, Apple Computer Inc.

2:15 PM - 3:45 PM

Session 131 T

Real-time Internet Communication

Ken Stober, Marketing Manager, Internet and Communications Group, Intel Corporation

Real-time communication applications require robust bandwidth that may not be available. The Internet was originally designed for text-only communications. Many pressures are being exerted on a system that was not designed to handle the load. This presentation covers the infrastructure changes necessary to transform the Internet from today's unreliable infrastructure to a fast network capable of real-time audio and video telephony. Issues covered include: high-speed home connectivity such as ADSL and cable modems; quality of service protocols such as the RSVP protocol; and next-generation applications that will take advantage of new capabilities.

Session 132 B T

Groupware or Intranet

Reed Sturtevant, Chief Technology Officer, Radnet, Inc.; **Keith McCall,** Director, Internet Applications, Lotus Development Corporation; Representative from Netscape Communications Corporation; **Paul Smart,** Vice President, Research and Development, Groupware Division, Novell, Inc.

As the intranet worms its way into the corporate communications infrastructure it has become conventional wisdom that proprietary groupware applications are a thing of the past. Is conventional wisdom on the mark? This panel, the masters of Groupware, Lotus Notes, and Novell GroupWise 5 shows how they are evolving to cope with Web-based alternatives.

Session 133 M T

Real-time Internet Gaming

Daniel Goldman, Chairman, The Entertainment Network ; **Microsoft Corporation**

When communities connect electronically, what do they do? They blow each other away. Is the Internet's killer app killing aliens? Is it Doom? Electronic games bring in more revenue than movies, here's the business case for online gaming. Also, the technical hurdles to bringing twitch games to a packet network.

Session 134 M B

Internet Personalization: Sending a Focused Message

Chris VandenBerg, Lead Program Manager, Internet Services Business Unit, Microsoft Corporation

Personalization of content and services is starting to appear in various Web sites as the best way for you to attract and retain customers with the most focused message. This session will examine who should be looking at personalization, how it builds value in the Web experience, why it may make sense for your site and how to accomplish it.

Session 135 B T

Web Auditing

Jack Powers, Director, Graphics Research Laboratory, Inc.

There is a wealth of information available through the standard data passed during a Web session but it is only useful if you know how to read it. This session teaches you how to get critical information about how your visitors are using your site and how you can use that data to improve it further. Also covered will be the proliferating set of auditing services available that let you collect more exact usage and demographic information.

M Marketing
T Technical
G General Interest
B Business/Management
D

CONFERENCE SESSIONS

4:00 PM - 5:30 PM

Session 141 B T

Agents and Personal Spiders

Nick Grouf, Chief Executive Officer, Firefly Network, Inc.; **Clyde Foster,** General Manager, Consulting and Integration Business Unit, Aspect Telecommunications

Offline browsing, Web automation and digital delivery systems can turn terabytes of digital noise into just the information you need. This session examines the impact of automated Web searching technologies on bandwidth, the delivery of services and the future of electronic commerce.

Session 142 M B

Directory Services: Turning Yellow and White into Green

Hope Blaythorne Rae, Sales Manager/Web Site Developer, Bell Atlantic Directory Services; **Kris Hagerman,** President/CEO, BigBook, Inc.; **Michael Santullo,** President, Four11 Corporation; **Jeff Killeen,** President/CEO, Pacific Bell at Hand

When France Telecom wanted to accelerate the adoption of MiniTel, it eliminated the phone book, attesting to its social power. Take a look at the future of online directory services and the business models supporting them and meet the pioneers of tomorrow's indispensable references.

Session 143 B T

Building and Deploying Applications on the Internet

David Hartzband, Chief Technology Officer, Riverton Software Corporation

The Internet is evolving as a platform at the same time that objects and components are evolving to boost custom application development. But the combination of the two trends will be even more significant, as the Internet will soon be used for the development, integration, and deployment of objects and components of robust applications. This session will look at: the recent evolution of application development and the role of the Internet in accelerating this evolution; current and future tools for building Internet-based applications; how organizations can begin today to prepare for a world of distributed objects; and requirements for tools and techniques needed to build object-based applications for the Internet.

Session 144 M B

Web-enabled Business Value

Gary Cohen, Vice President, Marketing, Internet Division, IBM Corporation

The Internet and intranets are creating new sources of Web-enabled value to businesses and organizations. Companies are deriving benefits on both sides of the accounting ledger from new revenue streams created through electronic commerce and global reach to intranet-driven cost savings and productivity gains through rapid internal communication and information exchange. This session will share results of international research on how real customers are progressing through phases of Internet adoption, leveraging existing investments and integrating internal and external business processes.

Session 145 M B G

Getting Your Net Worth Out of the Web

Larry Chase, President, Chase Online Marketing Strategies

The Internet can help you make money or save money. This session will show you how to use the Internet to reduce your cost of sales, labor, research and recruitment. You'll learn where to find information on the Net that others pay for. Attendees will receive a free subscription to *Web Digest For Marketers* and access to the *WDFM Archives*, which contain thousands of reviews of marketing sites previously covered in *WDFM*.

CONFERENCE SESSIONS

Thursday, March 13

9:00 AM - 9:45 AM

Morning Keynote

Frank C. Gill, Executive Vice President/General Manager, Internet and Communications Group, Intel Corporation

10:00 AM - 11:00 AM

Session 211 T

Internet Development with Distributed Objects and Components

Jeff Simmon, Director, Internet Products Division, Powersoft Business Group, Sybase Inc.

Object and component technology is emerging as the wave of the future, promising to improve application quality and boost developer productivity. The use of objects and components also will enable developers to quickly build effective Internet applications. This session will examine how organizations can leverage objects and components. It will also examine the use of object and component technology to extend client/server applications to the Web. Issues to be discussed include: review of C++, ActiveX and OLE objects; availability of pre-built Web-oriented objects and components; managing object development; and Java applets.

Session 212 B T

Internet and Intranet Firewalls: Black Art vs. Industry Standards

David Walter, Director of Marketing, Internet Business Unit, NEC Technologies

Learn the most important issues to be aware of when tackling network security; the advantages and disadvantages of UNIX and Windows NT as firewall platforms; and why evolving industry standards such as the SOCKS protocol are making it more attractive for network administrators to purchase commercial solutions.

Session 213 M B

The Art and Folly of Content Repurposing

Jill Ellsworth, Senior Partner, Oak Ridge Research

The initial vision of Web-based publishing was that existing publishers would reap new revenues from old content, "repurposing" it for an electronic audience. Somewhere between the vision and the implementation, the repurposing paradigm shifted towards adding original content. This session explores the factors that caused this change and how offline publishers should now be approaching the Web.

Session 214 B

The Training Gap

Dave Ellett, Vice President, Worldwide Education, Oracle Corporation

New technology comes with a hidden cost of retraining. Can the technology be used against itself? This session will look at: how organizations are going to fulfill their employees' ever-increasing training needs; new technology and delivery mediums that can help corporations, government agencies and educational institutions improve the quality of training while also meeting time and cost requirements; and the benefits and disadvantages of the instructor-led, media-based, distance learning and Internet-based training.

Session 215 B T

Windows Applications on the Web

Ray Thackeray, Director of Product Marketing, Insignia Solutions

This session will cover: publishing and demonstrating Windows applications on the Web; accessing applications from diverse platforms; integrating Windows applications with Web pages; and making real applications available to all NCs or set-top boxes.

CONFERENCE SESSIONS

11:15 AM - 12:15 PM

Session 221 G

The Kantor Group

Moderator: Andrew Kantor, Senior Editor, *Internet World* Magazine

Panelists: to be announced

If the McLaughlin Group were composed of the *digirati* would they be on this panel? A free-form discussion of Internet issues from censorship to standards wars with a panel of the usual unusual suspects.

Session 222 B G

The International Internet

Daniel Winokur, Senior Vice President, Internet and Data, Executive TeleCard

Explore the development of the Internet on an international level and its potential impact on the following areas: telecommunications regulation (i.e. competition, tariffs, etc.); Internet telephony as a challenger to the PSTN, globally; development of a unified voice/data network for interactive multimedia services around the world, including messaging and global content services and universal access to information regardless of location or language. This presentation will also cover developing trends and new technologies, highlighting specific services as examples.

Session 223 B ⊕

Internet Security

Kathy Kincaid, Director of I/T, Security Programs, IBM Corporation

Fear of security breaches keeps many companies off the Internet. This session highlights the most prevalent Internet-based threats and helps quell your fears with a discussion of the proven tools and methodologies — such as encryption, firewalls and secure servers — that are used to keep highly-networked business systems uncompromised.

Session 224 M B

Customer Service on the Internet

Jim Sterne, President, Target Marketing

Already using your Web site for marketing? Good. Now what are you doing for the customers you already have? Customer service has never been more important than today. The Internet is the fastest growing, most important innovation to hit the business world since the PC. The combination is explosive. The author of the new book, "Customer Service on the Internet," takes a practical look at how the Internet allows you to build relationships with individual customers, use computers to strengthen those bonds and keep your competition from pilfering your customer base. Specific suggestions and down-to-earth ideas for keeping your customers and keeping them happy.

Session 225 D B ⊕

The Webmaster Roundtable

Moderator: Matthew Cutler, President, The Webmasters Guild

Panelists: Alex Nathanson, Webmaster, Epson American, Inc.; **Lori Hylan,** Web Producer, Macromedia, Inc.; **Heather Champ,** Creative Director, The Primary Group; **Marcus Pierce,** Webmaster, *The Economist* Intelligence Unit

Hear from your peers about issues they face and solutions they've found in the day-to-day management of their Web sites.

Free Conference on CD-ROM

With your conference registration of $595 or more, you will receive the entire Spring Internet World '97 Conference on convenient to use CD-ROM format.
For more information and complete information on all the features included in this comprehensive CD-ROM, see page 46.

M Marketing
⊕ Technical
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B Business/Management
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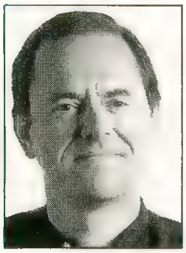
CONFERENCE SESSIONS

Thursday, March 13

1:15 PM - 2:00 PM

Afternoon Keynote



John R. Patrick, Vice President, Internet Technology, IBM Corporation

IBM

2:15 PM - 3:45 PM

Session 231 T

Building Dynamic-page Web Applications

Jeremy Allaire, Product Manager, Allaire Corporation

Static, document, and content-centric Web sites are dead. Today's Web demands dynamically created and on-the-fly personalization. And, as corporate computing shifts to the open platform of the Web, traditional developers are looking for tools and methods for building true client/server style applications on the Web. This workshop provides a detailed view of the architecture, tools and issues involved in building "dynamic-page Web applications". Issues covered include data-driven pages and database integration, server-side markup languages and extensions, security and user/session management, and will provide leading examples of dynamic-page applications in use on the Web today.

Session 232 B T

Guidelines to Choosing an Optimal Web System

Mike Blakeley, Benchmark Manager, Netscape Communications Corporation; **Ka Wai Leung,** Senior Product Strategist, Pyramid Technology; **Tony Vincent,** National SE Manager, Raptor Systems Inc.

Having trouble deciding on an appropriate Web server configuration? This session examines various design criteria for performance, scalability, availability, security and manageability of a Web system. These guidelines can guide you in determining an appropriate system architecture for current and future Web server requirements. Topics to be discussed include: sizing load requirements; software and hardware performance tuning tips; firewall and security considerations; understanding industry benchmarks; and building high availability architectures.

Session 233 M G

Publishers Survival Guide

Larry Chase, President, Chase Online Marketing Strategies

What publishing models are working? Which ones aren't, and why? How else can you make money from your site if your ad revenues fall short? Are you syndicating or recycling your content in order to amortize its cost? Do you realistically have any hope of making any money off your Web site? Chase, publisher of *Web Digest For Marketers*, answers these questions and shares innovative, practical insights taken from his own publishing experiences and those of his clients.

Session 234 M B T

Overcoming Customer Resistance to Using Credit Cards on the Internet

Peter Brockmann, Director, Market Development, Internet Solutions, Northern Telecom

Consumers demand a higher standard for the Internet than in real life. Will they really prefer an electronic equivalent to a credit card or do they want something simpler? This session will discuss what the industry has to do, what technologies will succeed and how to be a success among the early adopters.

Session 235 B T

Identity, Security and Authentication

Stratton Sclavos, President/CEO, VeriSign, Inc.

Verifying the identity of online customers is one of the thorniest problems hampering the growth of electronic commerce. Digital certificates are the solution. Already emerging as the way to track authorship of downloadable programs, certificates also open the door to commerce that offers the same safeguards online as in the real world. This session discusses how authentication works, the functions of digital IDs, and how their use opens the doors for non-repudiable electronic transactions.

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CONFERENCE SESSIONS

4:00 PM - 5:30 PM

Session 241 M

Real Companies Making Real Money on the Internet

Moderator: Mark Lonergan, Partner, Heidrick & Struggles

Panelists: To be announced

This roundtable discussion will focus on real (non-technology) companies who have overcome common wisdom and made the Internet an integral part of their businesses. The panel member will include executives from companies whose businesses are to provide services for the Internet, as well as those who use it as a vehicle to make money. The panel will provide solutions for gaining a competitive advantage drawing from their experiences utilizing the Internet. Changing business strategies and issues revolving around the Internet will also be discussed.

Session 242 B ⊕

The State of Internet Security

Allan Schiffman, Chief Technology Officer, Terisa Systems

Inside the corporation, the dialogue has broken down between IS personnel and executive management on issues of computer security. The IS engineers, responsible for implementing online technologies and procedures, don't adequately engage management to assess the bottom-line, practical security needs of the organization. As intranets merge with the Internet, sensitive and critical company information is even more at risk. This session will outline a comprehensive security review process to help guide you in your efforts to initiate this critical dialogue with management.

Session 243 M B

The Personalization Revolution

Michael Bauer, President, Imperative!

The Web forever changed how mass audiences access electronic information. The next stage of the market is already emerging: how individuals access information tailored for them. This session looks at how this emerging marketplace is working today and in the future — and exposes new revenue streams, tools and products to help you build the personal Web.

Session 244 D B ⊕

Author Once, Publish Many

Sherif Danish, Chairman/CEO, Saqqara Systems, Inc.

This session addresses the issues related to authoring and publishing product information in different media on a global scale in Fortune 500 companies. First, there are the issues of standardizing the vocabulary, the presentation, the internal format and the structure of the data elements at a division level or company level. Then there are the issues of publishing in different media (Web, print, CD-ROM) and the different publishing formats (Postscript, HTML, PDF, etc.). Last, there are the issues of publishing in different languages and in different countries. This session will present real-life case studies of Fortune 500 companies and how these various issues were addressed.

Session 245 G

The Seven Keys to Effective Web Sites

David Sachs, Assistant Dean, Pace University; **Pete Stair,** President, Mycroft Information LLC

Sachs and Stair, co-authors of "Hands-On Internet," "Hands-On Mosaic," "Instant Internet," "Hands-On Netscape" and "The Seven Keys to Effective Web Sites," will provide you with insights into those aspects of Web sites that will lead you to success. Their expertise has been gleaned from reviewing hundreds of sites which attract our attention, cause you to spend time there and lead you to purchase goods or services.

CONFERENCE SESSIONS

Friday, March 14

9:00 AM - 9:45 AM

Morning Keynote

Rob Glaser, President/CEO, Progressive Networks Inc.

RealAudio
ProgressiveNetworks

10:00 AM - 11:00 AM

Session 311 M

Strategic Web Marketing

Dave Geller, Editor-in-Chief, *Web Marketing Insider*

Marketing professionals will learn how to leverage their company's presence on the Internet by developing Web sites that properly balance content and image. You'll hear about the best free marketing resources on the Web today and learn dozens of Web marketing tips and tricks.

Session 312 M B G

Is Privacy a Thing of the Past?

Jim Sterne, President, Target Marketing

Computing power allows you to stop treating people like numbers and go back to treating them like human beings — individuals with specific likes, dislikes and points of view. When American Express asks "Do You Know Me?" the answer had better be "Yes." Your Web site is able to recognize your customer. Why doesn't it yet? The Web has stepped through two phases and has two more to go. First was the electronic brochure, then there was customer service. We are now in the midst of customer interaction and are on our way to mass customerization. Along the way, privacy will become a quaint sentiment. Mass marketing is a bug, not a feature and your life already is an open book, so get over it. This session covers mass customization to mass customerization and illustrates the point that the companies with the biggest databases and offering the most access — win.

Session 313 M B T

Expanding Internet Infrastructure Around the World

Eric Scace, Vice President, International Development, UUNet Technologies; **Alan Taffel,** Vice President, Sales and Marketing, UUNet Technologies

Internet Service Providers (ISPs) are in a race to build critical mass on a global scale, and technical, economic, social and political barriers and solutions continue to evolve. This session will examine projects that span geographic regions, countries and industries to illustrate the nature of the challenges and the dimensions of your potential solutions.

Session 314 M B

The Collision of Copyright and the Internet

Anthony Lupo, Attorney, Arent Fox

The Internet's greatest strength — universal connectivity enabling widespread sharing of data — is also the greatest fear of copyright holders. The near-zero marginal cost of distribution means nothing if your work is taken and redistributed for free by others. This session defines your rights as a copyright holder; teaches you how to defend your intellectual property in an electronic world; and discusses how-if-at-all-likely this is to change in the future.

Session 315 B T

The Java Electronic Commerce Framework

Arthur Coleman, Director of Electronic Commerce, JavaSoft

Learn how Java is taking electronic commerce to the next level by providing the framework for secure transactions with functions such as cryptography with digital signature functionality, encryption and authentication. Java also supports connectivity to corporate databases and brings secure purchasing to the Web with purchase management, payment processing and billing capabilities.

CONFERENCE SESSIONS

11:15 AM - 12:30 PM

Session 321 G

On the Firing Line

David Sachs, Assistant Dean, Pace University; **Pete Stair,** President, Mycroft Information LLC; **Tristan Louis,** Executive Director of Development, iWORLD; **Nate Zelnick,** Senior Editor, *Web Week* Magazine

An entirely interactive session based on questions and issues raised by audience members to the panel. Here's your chance to get the answer to a nagging question or to participate in a wide-range discussion of issues surrounding business on and the business of the Internet.

Session 322 ⊕

The Ins and Outs of Java Beans

Jim Mitchell, Sun Fellow, Vice President of Technology and Architecture, JavaSoft

Get the latest on Sun's initiative to implement an open component architecture written entirely in Java. Also, hear how Java Beans will allow developers to write Java applets and applications from reusable components that can transfer their functionality to other applets and applications, including platform-dependent applications.

Session 323 M

Emerging Business Models on the Internet

Eric Schlachter, Attorney, Cooley Godward Castro Huddleson & Tatum

This session will draw upon the presenter's experience representing entrepreneurial cyberspace clients to identify sustainable and successful business models on the Internet. In addition to analyzing the strengths and weaknesses of well-known business models such as advertising and user subscriptions, you'll learn about emerging models, including one-to-one marketing, marketing of ancillary goods and services and community information.

Session 324 M B

The Web as a Distribution Channel

Allison Fishman, Producer, Software Services, CNET; **Chip Hall,** Vice President of Marketing, Release Software Corporation; **Cindy Sweetser,** Vice President of Marketing, Softbank Net Solutions

While most of the attention has been focused on the Web as a publishing medium or the Web as a replacement for LANs, one key business opportunity is the Web as a distribution channel. More software is downloaded from the Internet everyday than is sold in all of the Egghead's in the world. Here's a look at the challenges and opportunities; and what the future Web channel might look like?

Session 325 M B

Will the Internet Replace the Phone for Customer Support?

Chris Zannetos, President, Courion Corporation

Unlike previous help desk and support technologies such as e-mail, IVRs and fax, the Internet (and intranet) can simplify both the support staff and customers' tasks. Learn the relative value of HTML, CGI and Java in the customer support arena.

12:45 PM - 2:15 PM

The Fourth Annual Internet World Magazine Industry Awards Luncheon

The Industry Awards recognize those companies, services, products and individuals who have excelled in their contribution to the Internet industry. For more information, see page 14. For nominations, go to www.iworld.com/awards.

Passport Pricing Saves You Up to $1,674!

Save up to $1,674 when you register for the Internet World Passport. You'll have access to every session, every sponsored and general workshop, all in-hall special events, the exhibit hall, and receive the complete conference on CD-ROM — a $2,969 value!* You can do it all for only $1,295 when you purchase your Passport by February 14.

* *Hands-on Workshops and* Internet World *Magazine Industry Awards Luncheon not included.*

M Marketing
⊕ Technical
G General Interest
B Business/Management
D Design/Graphics

CONFERENCE SESSIONS

Friday, March 14

2:30 PM - 3:30 PM

Session 331 G

Personalization Panel

Michael Bauer, President, Imperative!; **Pehong Chen,** President/CEO, BroadVision Inc.; **Chris VandenBerg,** Lead Program Manager, Internet Services Business Unit, Microsoft Corporation

A panel presentation by the vendors of the products that could possibly turn the Internet from its current shotgun approach to audiences to rifle marketing. The panel will also discuss the strategies and technical barriers to developing sites that provide unique views for each customer.

Session 332 G

Integrating Legacy Applications with CORBA

Ted Morin, Vice President, Consulting Services, I-Kinetics Inc.

This session will dicuss the motivation for transitioning to a COTS distributed object computing (DOC) infrastructure, the suitability of CORBA as an infrastructure, and the basic procedure for successfully employing encapsulation as part of a transition strategy.

Session 333 B

Internet Legal Roundtable

Edward Cavazos, Attorney, Andrews & Kurth LLP; **Lance Rose,** Attorney, Law Office of Lance Rose; **Eric Schlachter,** Attorney, Cooley Godward Castro Huddleson & Tatum

The expansion of the Internet has created difficult legal problems, including conflicts over copyright, censorship, privacy and jurisdiction. Learn how and where the law is likely to affect the provision of Internet services and where your current plans may be vulnerable.

Session 334 M

Web Advertising: Panacea or Pain?

Scott Capdevielle, Chief Technology Officer/Founder, Andromedia, Inc.; other panelists to be announced

The obvious answer to how anybody was going to make money on the Internet was advertising, but is the obvious answer the right one? This panel will examine the business of the Web and the questions that nag publishers today.

Session 335

Internet Video

Staffan Ericsson, Chairman, Vivo Software, Inc.; **Gary Eisips,** Director, Technical Marketing, VDOnet Corporation; **David Oldfield,** Director of Marketing, Xing Technologies Inc.

Deploying video over today's Internet is like teaching a dog to sing — it's unpleasant and it annoys the dog. Nevertheless, advances in compression technology, new bandwidth reservation protocols, streaming techniques and the promise of more robust backbones and higher-capacity delivery systems make it likely to arrive sooner than you think. See the state-of-the-art today and find out what the videonet of the future might look like.

3:45 PM - 4:45 PM

Session 341 B

The Intranet: Unleashing the Power of Data Warehousing

Jay S. Chaudhry, Senior Vice President, IQ Software Corporation

Corporations are trying to ride the Internet wave but struggling to understand the best implementation approach. This presentation explains different approaches you can employ to make corporate databases accessible to end-users via the intranet infrastructure. Topics that will be addressed during the session include: intranet approaches to data access and dissemination; the role of three-tier architecture; and the role of a Web server in data warehousing applications.

Session 342

Fundamentals of Streaming Media

Hilmi Ozguc, President/CEO, Narrative Communications Corporation; **Mark Cuban,** President, AudioNet

The World Wide Wait has dampened enthusiasm for CD-ROM quality animation over the Web. Discuss the differences between streaming vs. download-and-play, and the value of dedicated servers. Learn how companies such as Ben & Jerry's, Living Books, Joe Boxer and others are optimizing content for streaming animation, as well as simply repurposing existing content from popular authoring tools such as Macromedia Director

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CONFERENCE SESSIONS

— with better and faster results. AudioNet is out to make the Internet the third broadcast medium behind TV and radio, by becoming the TCI of the streaming media world. Learn how they are reaching more than 100K people a day, and making broadcasting on the Net a reality.

Session 343 ⊕

Server-side Scripting Languages

Marc G. Slack, Ph.D., President, Morph Technologies, Inc.

Advantages and disadvantages of different approaches to Server-side Scripting Languages; and their ability to ease the way for the novice yet provide the functionality and utility required by experienced programmers. This talk is aimed at providing managers with an understanding of the impact that software choices make on the productivity of your staff.

Session 344 B ⊕

Multicast Networking: The Solution for Internet Congestion

Stephen Collins, Vice President, Marketing, StarBurst Communications

Have you experienced an Internet "brownout?" Multicast networking may be a solution to your problems. At this session, you will learn how this technology is critical to making the delivery of your Internet content more efficient, how you can use it to deliver information simultaneously to thousands of users with 100 percent guaranteed delivery, and what technologies and standards are emerging to support it.

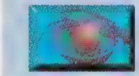
Session 345 D B ⊕

How to Test Your Web Page

Tom Arnold, Vice President, ST Labs, Inc.

Building and managing a Web presence is getting more important and first impressions count. This session identifies: testing areas (e.g. usability on layout and design, legal issues, content, applets and embedded scripts, browser compatibility, back-end processing (CGI) and server performance), Web-page properties, and testing tools and services.

Bring Your Entire Development Team



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To register for the Conference: To register yourself or additional members of your team for the Spring Internet World '97 Conference, simply photocopy the registration form on page 47 for each person who wishes to register.

To register for the exhibit hall only: If you're attending the exhibit hall only, use the Exhibit Hall registration form on page 7 for yourself and give the two tear-out registration forms to your colleagues. Additional printed programs may be ordered by calling **1-800-500-1959.**

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Los Angeles Convention Center

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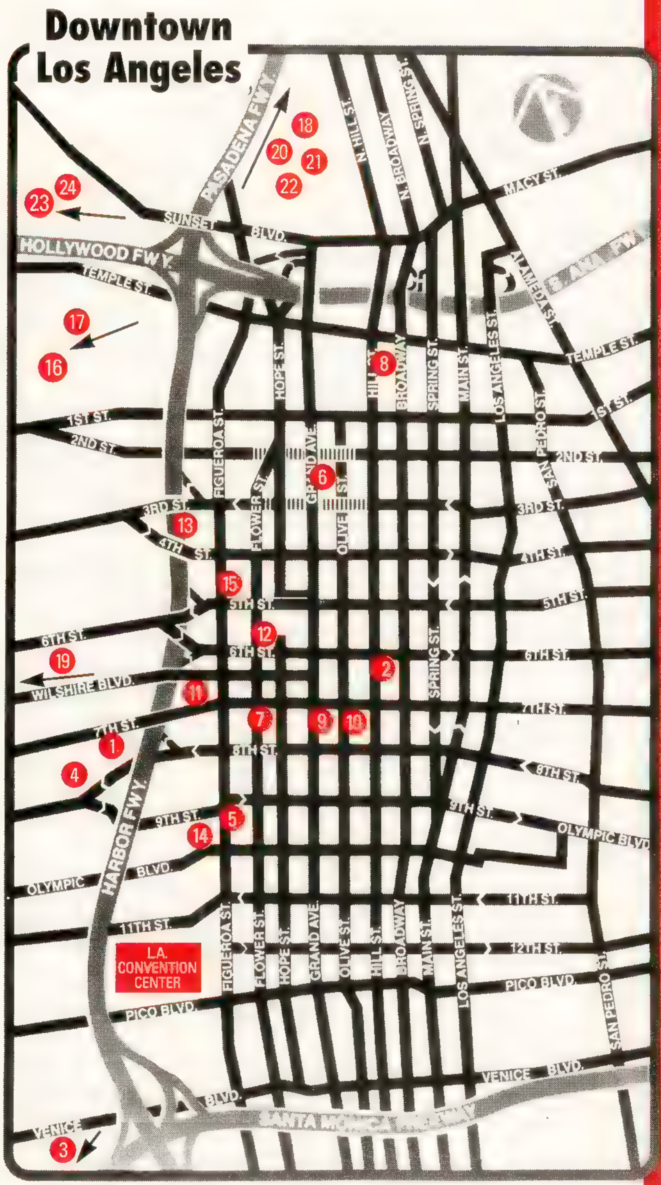

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Pre-conference workshops take place at the Biltmore Hotel Monday, March 10 and Tuesday, March 11.

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- Payment and registration form must be received together.

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For group bookings of 5 or more persons, call our Registration Department at 1-800-MECKLER (800-632-5537) or 203-226-6967 for reduced rates.

GOVERNMENT REGULATIONS

Mecklermedia accepts official government training orders in lieu of advance payment. Purchase orders must be sent with completed registration form.

ON-SITE REGISTRATION DESK

Pre-conference workshops are at the Biltmore Hotel and on-site registration for Monday and Tuesday will take place at the Biltmore Hotel. Please do not register at the Convention Center.

The Biltmore Hotel
506 Grand Ave.
Los Angeles, CA 90071

Conference Sessions and Registration on Wednesday, Thursday and Friday will be at the Los Angeles Convention Center ONLY:

Los Angeles Convention Center
1201 South Figueroa St.
Los Angeles, CA 90015

AIRLINE INFORMATION

Special discounted rates for Domestic and International travel with major U.S. airlines are available for Spring Internet World '97 attendees. Lee Travel, the official travel agency for Spring Internet World '97 offers great savings that do not require a Saturday night stayover. To book your flights, please call Lee Travel at 1-888-SHOW-RES, or 1-800-303-4251 or e-mail: bookit@mecklermedia.com.

HOTEL INFORMATION

Attendees are responsible for their own hotel and travel arrangements (see pages 44-45 for hotel details). Please book your hotel room and travel early for best value and choices. Hotel information will be available on Mecklermedia's iWORLD Web site at http://events.iworld.com.

CANCELLATIONS AND SUBSTITUTIONS

If you must cancel for any reason, notify our Registration Department in writing by March 3,1997 for a full refund. No refunds will be given after this date. You may transfer your registration to another person at any time.

ON-SITE REGISTRATION HOURS

Monday, March 10 (Biltmore Hotel)
7:00 AM - 6:00 PM
Tuesday, March 11 (Biltmore Hotel)
7:00 AM - 6:00 PM
Wednesday, March 12 (Convention Center)
7:00 AM - 6:00 PM
Thursday, March 13 (Convention Center)
7:30 AM - 6:00 PM
Friday, March 14 (Convention Center)
7:30 AM - 4:00 PM

CONFERENCE AND EXHIBIT HOURS

Pre-Conference — Biltmore Hotel	
Monday, March 10	10:00 AM - 4:00 PM
Tuesday, March 11	10:00 AM - 4:00 PM
Conference — L.A. Convention Center	
Wednesday, March 12	9:00 AM - 5:30 PM
Thursday, March 13	9:00 AM - 5:30 PM
Friday, March 14	9:00 AM - 4:45 PM
Exhibit Hours — L.A. Convention Center	
Wednesday, March 12	10:00 AM - 6:00 PM
Thursday, March 13	10:00 AM - 6:00 PM
Friday, March 14	10:00 AM - 4:00 PM

PROGRAM UPDATES ON THE WORLD WIDE WEB

Regular program updates are available on Mecklermedia's iWORLD at http://events.iworld.com.

Note: The sponsors and management of Spring Internet World '97 reserve the right to make necessary changes in this program. Every effort will be made to keep presentations and speakers as represented. However, unforeseen circumstances may result in the substitution of a presentation topic or speaker.

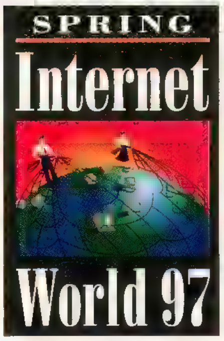
Mecklermedia reserves the right to use photographs of any Spring Internet World '97 attendee for future promotions.

Mecklermedia Corporation assumes no liability for the acts of their suppliers nor for the safety of any Spring Internet World '97 participant while in transit to or from this event. The total liability during the precise hours of the meeting will be limited to a refund of the delegate fee.

REGISTER BY FEBRUARY 14 AND SAVE.

Conference Registration Form

THE FOURTH ANNUAL



MARCH 10-14, 1997
**Los Angeles
Convention Center
Los Angeles, CA**

Please note: conference registration includes admission to exhibit hall. If you are registering for the conference, you do not need to register separately for exhibit hall admission. To register for exhibits only, please turn to page 7.

IWF

To receive additional printed conference brochures, call us at 1-800-500-1959 or e-mail us at siwprogram@mecklermedia.com. For immediate, up-to-date conference information, visit us at http://events.iworld.com

1. Your Information (photocopy for additional registrants)

☐ Mr. ☐ Ms. ☐ Dr.

LAST
FIRST
M.I.
TITLE
COMPANY
STREET
DIVISION
MAIL STOP
CITY
STATE/PROVINCE
ZIP/POSTAL CODE
COUNTRY
PHONE
FAX
E-MAIL

2. Your Industry:

(check only one)

- ☐ A. Computers/IT - Hardware/OEM
- ☐ B. Computers/IT - Integrator/Consulting/VAR
- ☐ C. Computers/IT - Software Development
- ☐ D. Consumer Electronics/Games
- ☐ E. Entertainment/Broadcast Communications
- ☐ F. Finance/Banking/Insurance
- ☐ G. Government/Defense
- ☐ H. Healthcare
- ☐ J. ISP/Online Service
- ☐ K. Manufacturing
- ☐ L. Marketing/Advertising
- ☐ M. Media (Publishing, Broadcasting)
- ☐ N. Retail/Catalog
- ☐ P. Telecommunications
- ☐ Q. Web Development/Design
- ☐ R. Other ______________ (please specify)

3. Your Job Function: (check only one)

Technical Functions

- ☐ A. CIO/CTO or VP/Director MIS/IT
- ☐ B. Network Administrator
- ☐ C. MIS/IT Technical Staff
- ☐ D. Project Management - Technical
- ☐ E. Webmaster/Developer/Designer
- ☐ F. Software Developer
- ☐ G. VAR/Distributor

Non-Technical Functions

- ☐ H. CEO/CFO/COO, Owner, VP
- ☐ J. Manager, Finance/Accounting
- ☐ K. Manager, Marketing/Sales
- ☐ L. Project Management - Non-Technical
- ☐ M. Other

4. Size of Your Organization:

(check only one)

- ☐ A. 1-10
- ☐ B. 11-100
- ☐ C. 101-1000
- ☐ D. 1001-10,000
- ☐ E. Over 10,000

5. Your Role in Purchasing Internet Products: (check only one)

- ☐ A. Final Decision Maker
- ☐ B. Specify Product or Vendor
- ☐ C. Recommend Product or Vendor
- ☐ D. No decision making responsibility

6. Choose Your Conference Options

	Early Bird	After Feb. 14	
☐ **Internet World Passport (Save $1,575!) (PP)**	$1,295	$1,395	

Includes carte-blanche access to **everything** throughout the entire 5 days (including Platinum Bonus-Pak below) except hands-on workshops. Come and go as you please to any session, workshop or keynote.

	Early Bird	After Feb. 14	
☐ **Full Conference (FC)**	$795	$895	

Includes all **Conference Sessions** Wednesday through Friday plus Platinum Bonus-Pak below. (No workshops)

	Early Bird	After Feb. 14	
☐ **Conference Sessions By The Day**	$395	$495	

Includes any single day of **Conference Sessions** Wednesday through Friday plus Gold Bonus-Pak below. (No workshops)
You must specify which day: ☐ Wednesday (WC) ☐ Thursday (TC) ☐ Friday (FR)

	Early Bird	After Feb. 14	
☐ **General Workshops**	$395	$495	

Includes any one day of **General Workshops** of your choice plus Gold Bonus-Pak below. You must specify day(s):
☐ Monday (MW) Biltmore ☐ Tuesday (UW) Biltmore ☐ Wednesday (WW) ☐ Thursday (TW) ☐ Friday (FW)

	Early Bird	After Feb. 14	
☐ **Single-Day Sponsored Workshops**	$395 ea.	$495 ea.	

Includes any **One-Day Sponsored Workshop** or half of any Two-Day Sponsored Workshop, plus Gold Bonus-Pak below. You must specify your choices:

- ☐ Apple Developers Day (AP)
- ☐ Adweek Forum Monday Only (AM)
- ☐ Adweek Forum Tuesday Only (AT)
- ☐ Intel Day (ID)
- ☐ Internet Finance Friday (FF)
- ☐ ISP World Wednesday (IW)
- ☐ ISP World Thursday (IT)
- ☐ Sun Java Computing Day (SJ)
- ☐ Microsoft ActiveX (MA)
- ☐ Red Herring (RH)
- ☐ Sun Developers Day (SD)
- ☐ VRML World (VW)

	Early Bird	After Feb. 14	
☐ **Two-Day Sponsored Workshops**	$595 ea.	$695 ea.	

Includes any one **Two-Day Sponsored Workshop** plus Platinum Bonus-pak below. You must specify your choice:
☐ Adweek Forum (AF) ☐ ISP Business Strategies (Wednesday and Thursday) (OT)

	Early Bird	After Feb. 14	
☐ **Hands-On Workshops**	$495 ea.	$595 ea.	

Includes any **Hands-on Workshop** plus Gold Bonus-pak below. You must specify your choice(s):
☐ HO1 ☐ HO2 ☐ HO3 ☐ HO4 ☐ HO5 ☐ HO6 ☐ HO7 ☐ HO8 ☐ HO9 ☐ HO10
☐ HO11 ☐ HO12 ☐ HO13 ☐ HO14 ☐ HO15 ☐ HO16 ☐ HO17 ☐ HO18 ☐ HO19 ☐ HO20

	Early Bird	After Feb. 14	
☐ **Internet World Magazine Industry Awards Luncheon (AL)**	$45	$45	
TOTAL (You must include payment with your order.)			

Platinum Bonus-pak
Includes admission to the 2,400 booth exhibit hall Wednesday through Friday, all keynote sessions and special events, access to the Internet World Cafe, the Conference CD-ROM (full transcripts of every session in a searchable form), show t-shirt and tote bag.

Gold Bonus-pak
Same as Platinum but without the Conference CD-ROM.

7. Payment Method

Payment or Government Purchase Order must accompany advance registration and be received by February 28. After this date, please register on-site. Conference fees are non-refundable after March 3, 1997.

☐ **Check or Money Order enclosed (Make payable to Mecklermedia Corporation.)**
☐ **Government Purchase Order enclosed (Must accompany registration form.)**
☐ **VISA** ☐ **MASTERCARD** ☐ **AMERICAN EXPRESS** ☐ **DINERS CLUB**

CARD NUMBER EXP. DATE
CARDHOLDER'S NAME
SIGNATURE TODAY'S DATE TOTAL AMOUNT

8. Fax to: (203) 226-6976 or Mail to: SIW97 REG/Mecklermedia, 20 Ketchum St., Westport, CT 06880

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- **Apple Platform Developers Day**
- **Internet Daily Stock Report's Finance Friday**
- **The Red Herring Internet Entrepreneur Forum**
- **ADWEEK Advertising Forum**
- **VRML World Developer Day**
- **Microsoft ActiveX Developer Day**

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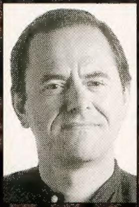
Chairman, President/ CEO of Digital Equipment Corporation

Dr. Gilbert F. Amelio
Chairman of the Board/CEO, Apple Computer, Inc.

Frank Gill
Executive Vice President/ General Manager, Internet and Communications Group, Intel Corporation



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See page 7 for Exhibit Hall Registration.

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